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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Chemical Overseas Trade

THE Board of Trade returns for August clearly reflect the effects that the strike is producing on our overseas trade in chemicals, drugs, dyes, and colours. And unfortunately the upward trend of imports and the downward trend of exports and re-exports are still present if the comparison between this year and last is extended to cover the first eight months of each year. Comparing August of 1926 with August of 1925, the chemical imports have increased £192,178, the chemical exports have decreased £210,127, and the chemical re-exports have decreased £28,259. Comparing, again, the first eight months of 1926 with the first eight months of 1925, chemical imports have increased £350,769, chemical exports have decreased £962,778, and chemical re-exports have decreased £149,687. There is a consistency about these figures that is rather disquieting.

Some of the detailed figures are significant. The coal tar products imported, for example, have increased from £69,593 in August of last year to no less a sum than £253,998; on the other side the exports of coal tar products have fallen from £115,549 last August to £79,262. Both these results may without much doubt be attributed to the coal situation, and explain the growing anxiety to see practical steps taken to determine the dispute. Another notable case of decline is found in sulphate of ammonia, the exports of which have declined from £236,950 in August of 1925 to £119,249 this year. France imported none last month, as compared with £5,635 in August of last year, and there is a heavy decline in the four principal markets—Spain and the Canaries, Dutch East Indies, Japan, and British West India Islands. Sulphuric acid exports, regarded often as a barometer of trade, have fallen from £3,160 to £1,689. Dyestuff exports, again, have declined from £63,545 to £41,294; of natural indigo we imported £2,120 (81 cwt.) against none last August. The strong position this country holds in painters' materials and colours, however, is shown in the improved figures—one of the very few satisfactory sections—the exports having risen from £295,867 to £329,295. Re-exports, which represent more specifically the merchant trade, are down considerably in the total, though here and there a slight advance is to be noted. The moral of it all is clear. It is not to make matters worse by pessimism. It is to give stricter attention to quality of production, to the reduction of costs by the use of the best methods, and to increasingly vigorous propaganda and efficient distribution and sales in all our overseas chemical markets. The situation is bound to clear presently, and the wise policy is to be ready for the chance when it comes.

Coke-Oven Hydrogen for Ammonia

IT is a self-evident fact that the *sine quâ non* of any process for the fixation of nitrogen through ammonia synthesis is the provision in the first place of a cheap source of hydrogen. Up to the present the production of large volumes of hydrogen *via* the water gas process seems to have established itself as the most economical method in those countries which are not blessed with abundant reserves of natural power, but in view of the reported success of the Claude installation at the Béthune mines in Northern France, the consideration of hydrogen from coke-oven gas as an alternative to the water gas process is becoming of increasing importance. Claude has, of course, always written enthusiastically of the great advantages of extracting hydrogen from the gas evolved from the distillation of coal, but it has invariably been difficult to obtain any precise information as to the cost of the liquefaction process. Comparisons have, accordingly, been extremely difficult to make. For this reason, the Fixed Nitrogen Research Laboratory of the United States Department of Agriculture has performed another signal service to those associated with the nitrogen industry by deputing one

of its research workers, Mr. Barnett F. Dodge, to undertake a survey of the conditions appertaining in both processes. Necessarily, the final conclusions which were reached must be regarded as representing only the approximate economics of the two cases, for in individual plants so much must depend upon local conditions, and particularly upon whether there is a demand for the surplus coke-oven gas or whether it can merely be regarded as a waste product.

The method adopted by the Nitrogen Research Laboratory was to take as a basis the hydrogen, purified and compressed ready for service, required for the fixation of one ton of ammonia, and to draw up cost sheets which in themselves are most instructive for the reason that no detail in the items which contribute towards the gross expenditure seems to have been overlooked. It is not, of course, possible to examine the many interesting features of these cost sheets here, but in view of the doubts which have been expressed as to the possibility (from the commercial standpoint) of utilising coke-oven hydrogen, it is noteworthy to find that, on the basis adopted, the coke-oven liquefaction process is about on a parity with the water gas catalytic process. Under the conditions assumed, therefore, the coke-oven process does certainly appear worthy of serious consideration.

Decomposition of Hydrocarbons

WHEN consideration is given to the composition of coke-oven gas and to the proportion of hydrogen in the original coal it can be appreciated that the possibilities of the process are by no means exhausted. Normal coke-oven gas contains, for instance, about 48 per cent. of hydrogen in the free state, but considerable quantities of the original hydrogen are found in the gas combined as methane and unsaturated hydrocarbons. If, therefore, the whole of the hydrogen in the gaseous hydrocarbons (both saturated and unsaturated) could be liberated as free hydrogen, then the quantity of the latter which could be obtained from a ton of coal would be increased nearly threefold. This, of course, would result in a very material reduction in the cost of hydrogen extraction by the liquefaction process. Here, then, an opportunity is presented for the development of means for the liberation of the combined hydrogen by thermal decomposition, thus increasing both the amount and the concentration of the hydrogen in the gas to be subjected to liquefaction. Comparatively complete decomposition should by no means prove impossible, but the methane might present difficulties, for although its decomposition is practically complete at 1,000° C., the rate of breaking down would not be sufficiently rapid for commercial purposes. Some investigators have shown, however, that 85 to 90 per cent. of the hydrocarbons in coke-oven gas could be decomposed to carbon and hydrogen by heating to 1,200° C., but the cost of the treatment appears to be quite indefinite. The attraction of a process of the kind lies in the fact that (assuming that all the unsaturated hydrocarbons and 90 per cent. of the methane could be decomposed) 1,000 cubic feet of normal coke-oven gas would yield 1,360 cubic feet of a final gas containing no less than 84 per cent. of hydrogen.

National or District Agreements

BEFORE the start of the coal strike nearly twenty weeks ago, this Journal called attention to the paradoxical position of miners and engineers, who were then fighting for principles that were mutually destructive. The engineers have not occupied much space in the newspapers since the coal strike began, but the engineers' question still exists. Engineers are admittedly receiving very low wages, and it cannot be long before the nation will be faced with a demand for some sort of a settlement on their behalf. The engineers took the view, a view with which we sympathise, that in those parts of the country where trade was better, or in those branches of engineering, such as printing machinery or electrical work, which were not so depressed as other branches, wages might reasonably rise above the national rates agreed between the two national organisations. Following on the unofficial Hoe strike there was some talk of a national engineering strike to enforce district agreements, but the engineering employers took the other view, and in obedience to modern ideas as to the need for national organisation insisted upon national rates or nothing. This, as we pointed out at the time, was the first big cleavage in the ranks of organised labour on a question of principle.

The miners, in fighting in the opposite camp to the engineers, have behind them the best tradition of the trade union movement, but they are no longer able to claim that they represent a principle, in view of the attitude of the engineers. This difference was in no small degree responsible for the impotence of the Trade Union Congress last week, which very wisely fenced with the question of national agreements and thus avoided bringing out these differences in the ranks. The adoption for the moment by the colliery owners of the argument invented by the engineering unions has had the effect of delaying a settlement of the coal strike, but that delay may be amply worth while if it results in a general recognition of the practical fact that rates of wages depend upon natural conditions and that natural conditions vary in different districts.

Ammonia Recovery by Gypsum

A PAPER on this subject, which was read by Mr. Harold W. Jackman before the Michigan Gas Association, is interesting, because it indicates that America is thinking and experimenting on lines similar to those which are engaging the attention of many chemists and technicians in this country. Gypsum has been suggested as a substitute for sulphuric acid in the manufacture of ammonium sulphate, because it has been used advantageously by synthetic producers not only in Germany but in this country. It is known that there are suitable and plentiful supplies available in this country at prices calculated to yield a marked advantage over those at which sulphuric acid is at present being supplied. A process for the manufacture of by-product sulphate of ammonia, in which anhydride is employed, has yet to be worked out. At all events, there is no established method, and if such a process is to be applicable to medium-sized and tolerably large gasworks, it must be of a fool-proof character.

Mr. Jackman's paper possesses an enhanced interest,

because the utilisation of anhydrite in the manufacture of by-product sulphate of ammonia is approached from the standpoint of medium-sized gasworks. Two processes are outlined—the indirect and the direct. The indirect process involves the production of concentrated gas liquor of 15 per cent. NH_3 content. This solution is converted into ammonium carbonate by decomposing the sulphide and bisulphide with carbon dioxide. A packed absorption tower is suggested, through which the concentrated gas liquor is slowly distributed, and up which flue gases are made to ascend. It is said that if the flue gases enter at the bottom of the tower containing 10 per cent. of CO_2, they will leave the top containing only 1 per cent. It will be appreciated that H_2S is released in the carbonation process, and must be recovered. The next stage is one in which the solution of ammonium carbonate is made to react with the anhydrite. The latter is ground to a fine state of division, and is maintained in suspension in the solution of ammonium carbonate. After two hours it is affirmed that 95 per cent. of the ammonia is converted to ammonium sulphate. The next step is to effect the separation of the insoluble calcium carbonate from the ammonium sulphate solution. A continuous filter is used for this purpose. Finally, after the ammonium sulphate solution has been passed through a still, to remove 5 per cent. of volatile ammonia which it contains, the sulphate solution is evaporated.

Economic Aspects of the Process

MR. JACKMAN deals briefly with the economic aspects of this process, and shows the saving to be effected by the use of anhydrite in lieu of sulphuric acid. Such saving is clearly substantial. In examining the process in detail, however, one is inclined to doubt whether the decomposition of ammonium sulphide and ammonium bisulphide in concentrated gas liquor is quite so easy as is represented. It is known that in the manufacture of ammonium carbonate by the carbonation process gas liquor was invariably preferred to concentrated gas liquor, and that lime kiln gases containing about 40 per cent. of CO_2 were used, because flue gases were sluggish in action and involve the release of unnecessarily large quantities of ammonia. Moreover, the presence of SO_2 in flue gases was often a source of inconvenience, and occasionally involved loss of ammonia on evaporation. The separation of calcium carbonate from the ammonium sulphate solution is fraught with some difficulty, while another important consideration which arises is that the calcium carbonate must be washed free from ammonium sulphate solution, yet the latter must not be unduly diluted, otherwise evaporation costs will be increased at a later stage of the process. Whatever wash water is used must be limited in quantity, and it must be utilised at an earlier stage of the process.

One would hesitate to countenance the distillation of the ammonium sulphate solution, in order to effect the removal of the volatile ammonia. This is far too expensive an operation. It seems preferable to use a small quantity of sulphuric acid for the conversion of any volatile ammonia to ammonium sulphate, rather than to resort to an expensive distillation process. These observations are merely offered, of course, in a helpful spirit and in the hope that they may prove useful to those who are working out details of a process similar to the one under review.

Chilean Nitrate Competition

ATTENTION was drawn in our last issue to an interesting suggestion by Mr. T. T. Aikman as to a working agreement between the I. G. Farbenindustrie, the controllers of the German synthetic nitrogen industry, and the Chilean nitrate producers. We were a little doubtful at the time whether the German interests would welcome the idea, which seemed to indicate the exclusion of the British Sulphate of Ammonia Federation, and are not surprised to find, from an article in the *Hamburger Fremdenblatt*, that the German producers are by no means inclined to enter into any arrangements of the kind mentioned with the Chilean interested parties. This is confirmed, it is stated, by the fact that the synthetic nitrogen industry, which is still comparatively young, is in process of the fullest further development, and cannot be strangled. As to prices, even in the event of the free trade which is advocated on various sides in Chile, and of a reduction of the Chilean duty, far-reaching prospects are still open, as later on, with a cheapening of the production process, further reductions may be expected. Synthetic prices stand in very favourable relation to any cheapening that may become possible through the recent procedure of the "Caliche" elaboration by Guggenheim. It may be mentioned, concludes the *Hamburger Fremdenblatt*, that for some time past patent or licence negotiations have been going on between the I.G. Farbenindustrie and American authorities on the nitrogen question. That this is not mere rumour is indicated by the announcement that the director-general of the I.G., Dr. Bosch, the joint author with Dr. Haber of the German process for the fixation of atmospheric nitrogen, is proceeding shortly to America with Mr. Meer, another director, and Mr. Schmitz, the financial director. All the indications point in favour of the synthetic product being able to hold its own against the natural Chilean product, and some federal understanding between the synthetic producers of Germany, Great Britain, and the United States—covering both prices and propaganda, and designed to resist competition from Chile—seems more probable than an attempt to arrange an understanding between Germany alone and the Chilean nitrate interests.

Books Received

SURFACE EQUILIBRIA OF BIOLOGICAL AND ORGANIC COLLOIDS. By P. Lecomte du Nouy. New York: Chemical Catalog Co. Inc. Pp. 212. $4.50.

THE CHEMICAL TECHNOLOGY. A Monthly Journal of Chemistry and Chemical Industry (Conducted by Professor Dr. H. Nishida). Published by Kagaku-Kogei-Sha, Kiriu, Japan. Y. 6.94 per year. Y. 3.52 per half year.

The Calendar

Sept 18	Cannon Ironfoundries Centenary: Dinner and Presentations. 1.30 p.m.	Winter Gardens, Blackpool.
20 to 24	**Chemists' Exhibition.**	**St. Andrew's Hall, Glasgow.**
24 to 27	Association of Special Libraries and Information Bureaux: Third Conference.	Balliol College, Oxford.

A Century of Aniline Oil

By Dr. M. L. Crossley

The following notes on the centenary of aniline oil, by Dr. M. L. Crossley, of the Calco Chemical Co., U.S.A., appear in the current issue of "Chemical Markets" with the characteristic comment: "Discovered in 1826, neglected for thirty years because it would not yield quinine, it is now produced in this country (U.S.A.) alone at the rate of 22,000,000 lb. per year to make the bulk of our dyes, as well as rubber accelerators, lakes, photographic chemicals, drugs, and many other products."

We celebrate the one hundredth birthday of aniline this year. Its useful career is filled with stirring episodes. The alliances of aniline have been many and varied. It has had a leading position among the important families in its class and still holds the centre of the stage in the imagination of the populace. We think we know a good deal about aniline and yet it surprises us now and then by showing us some new trait of its character we had not dreamed it possessed. Thus we are forced to acknowledge that there is much we have yet to learn about aniline, though we have known it for a century.

Aniline is a limpid oily fluid somewhat inclined to colour in the air when associated with other members of the family of lesser distinction and importance. In years past the commercial grades of aniline were dark in colour, but now it can be obtained almost water-white. Its quality was never better. Aniline is not very volatile and possesses considerable stability in spite of its great activity.

It was in 1826, before the dawn of synthetic chemistry, that Unverdorben recognised aniline in the products of the destructive distillation of indigo and assisted it across the threshold of experimental chemistry into the light of acknowledged facts, introducing it under the name "Krystallin." This name was chosen for what aniline did and not for what it was. On associating with acid, it became crystalline, and Unverdorben, after satisfying himself that this was a characteristic behaviour, gave it the name which identified it among his laboratory curiosities. Eight years elapsed before it received any further recognition. In 1834 Runge detected aniline in coal tar. He failed, however, to recognise it in its new associations as the "Krystallin" of Unverdorben, and christened his product "Kyanol," the name being selected on the basis of its chemical behaviour—this time with hypochlorites to form a blue substance, and indicating "blue oil." Once again aniline was buried in the graveyard for laboratory curiosities and practically forgotten. In course of time, 1840, Fritzsche once more re-discovered aniline among the products obtained on distilling indigo with potash and named it "aniline," this time the name being taken from "indigofera Anil"—the name of the indigo plant from which the indigo was obtained. About the same year Zinin made aniline by reducing nitrobenzene with ammonium sulphide and called his product "Benzidam." The several products made reposed peacefully in the laboratories of the particular investigators under the above aliases until 1843, when Hofmann gave the culprits a thorough chemical "third degree" examination and proved them to be identical. This brilliant investigator also demonstrated that aniline could be obtained by reducing nitrobenzene with hydrochloric acid and metals. This is the basis of the present industrial process for the manufacture of aniline.

Thirty years rolled by before aniline made its *début* in industry. In the years just prior to 1856 aniline was vigorously attacked on the assumption that it could reveal the identity of quinine and its relationship to this much sought after drug, but no amount of chemical persuasion could induce aniline to produce quinine, and had it not been for the keen perception, courage, and perseverance of a Perkin the product would have returned to the chemical curiosity shop and have remained a chemical spinster for a much greater span of years.

Perkin's Discovery

Perkin's discovery of the first "aniline dye" in 1856 created new interest in aniline and focused attention on its commercial possibilities. Soon thereafter several investigators became acquainted with aniline and discovered its versatility in chemical syntheses. The first industrial exploitation of aniline was undertaken on a very modest scale by Simpson and Maule. The transition from the laboratory to the plant was difficult and slow. Suitable plant equipment did not exist and had to be developed. The first nitrobenzene required for the manufacture of aniline was made in glass balloons of about one litre capacity. These were strung up, several in a row, and swung around occasionally to mix their contents. Modern equipment for the manufacture of both nitrobenzene and aniline is the best that engineering knowledge and skill can devise.

The parent compound of aniline is nitrobenzene and this is derived from benzene which in turn is obtained by splitting up the complex substance, coal, into a number of different products of varied chemical and physical characteristics. Coal is composed chiefly of carbon systems, molecular universes, each made up of atomic worlds of more or less subatomic complexities. Benzene is obtained by heating coal in closed vessels in the absence of oxygen or air. It is a hydrocarbon of the cyclic type of molecular architecture and is composed of atomic systems which when released from the bonds that mutually hold them together as benzene manifest the characteristic properties of carbon and hydrogen. There are six carbon and six hydrogen atoms in one benzene molecule.

In forming nitrobenzene, the benzene is nitrated with a mixture of sulphuric and nitric acids. One hydrogen atom of the benzene molecule is exchanged for a nitro group (NO_2) from the nitric acid. Nitrobenzene, $C_6H_5NO_2$, and water, H_2O, result. The sulphuric acid absorbs the water and becomes "spent acid." The nitrobenzene separates from the spent acid combination and is washed with water to make it suitable for its conversion to aniline. Aniline is composed of carbon, hydrogen, and nitrogen, arranged in a definite and characteristic manner into two partnership groups—C_6H_5 and NH_2. The properties that differentiate aniline from benzene are contributed to the system by the NH_2 group which indicates the relationship of aniline, $C_6H_5NH_2$, and ammonia, $H\text{-}NH_2$. The two are chemical cousins and possess certain family resemblances in common.

Commercial Production Methods

Commercially, aniline is made by reducing nitrobenzene with iron "borings," hydrochloric acid, and water. The iron is obtained chiefly as waste product in the manufacture of machined castings. The hydrochloric acid is obtained either from common salt by the action of sulphuric acid or by causing chlorine and hydrogen to combine directly. The reactions involved in the formation of aniline are much more complex than is indicated by the end products of the reduction. The acid first attacks the iron and releases hydrogen which combines with part of the oxygen in the nitrobenzene. In the meantime the chlorine combines with part of the iron and converts it into ferrous chloride which proceeds, with the aid of the remaining iron, to displace the hydrogen from the water and make use of its oxygen and form iron oxide. The freed hydrogen then replaces the balance of the oxygen in the nitrobenzene and also combines with it to form water. The nitrogen is now left holding two hydrogens. The new system therefore, comprises two groups, C_6H_5 and NH_2, in intramolecular balance and manifests properties which identify it as aniline, $C_6H_5NH_2$. The aniline is separated from its reaction companions, iron, iron oxides, iron hydrates, water and graphite, by distillation.

The chemical equations covering the above reactions are as follows:

Nitration of Benzene:

$$C_6H_6 + HNO_3 = C_6H_5NO_2 + H_2O$$

Reduction of Nitrobenzene to Aniline:

$$C_6H_5NO_2 + 6HCl + 3Fe = C_6H_5NH_2 + 3FeCl_2 + 2H_2O$$

$$C_6H_5NO_2 + 9FeCl_2 + 10H_2O = C_6H_5NH_2 + 3Fe_3O_4 + 18HCl$$

Aniline first won recognition in industry as an intermediate for dyes. The synthesis of Mauve by Perkin paved the way for the development of a new industry. The key had been found to Nature's treasure box and discovery after discovery followed in rapid succession until not only were the natural dyes duplicated by synthesis, but many dyes having no

counterpart in Nature were produced and marketed. At first all the synthetic dyes were made from aniline, either directly or indirectly, and "aniline dyes" was synonymous with synthetic dyes. This is no longer true. Many synthetic dyes are now made from other intermediates. Aniline is, however, a very important dye intermediate as well as a useful raw material for the manufacture of a variety of other substances of great commercial importance. The annual production of aniline in the United States is over twenty-two million pounds.

Some of the most important of the dyes derived from aniline are: Nigrosine, Induline, Fuchsine, Methylene Blue, Auramine, Tartrazine, Indigo, Methyl Violet, Malachite Green, Gallocyanine, Chrysoidine, and Orange II. There are many other dyes requiring aniline in their manufacture, but the relationship is not quite so direct as in the above examples. Aniline is used in the manufacture of drugs such as cinchophen and acetanilide; rubber accelerators such as thiocarbanilide, formanilide, phenylguanidines, etc.; photographic chemicals such as hydroquinone; lakes such as Para Red, Lithol Red, and Aniline Black; food dyes such as Tartrazine, Orange I, Methyl Violet, and indigo-sulphonic acids; in the manufacture of plastics; for the production of aniline black on furs and other fibres; and for a variety of other purposes.

Future of the German Wood Distillation Industry

Competition of Synthetic Methanol and Acetic Acid

In view of increasing competition everywhere between synthetic and natural products, the following article, dealing with difficulties of this nature which have arisen in Germany, deserves special attention. It is based on information in the German Press.

FOLLOWING upon recent references to the German natural ammonia and benzol industries, the existence of which appears to be threatened by synthetic products, attention may be drawn to the prospects of the wood distillation industry, which may also be detrimentally affected for the same reasons. In the course of an article published in a recent issue of the *Frankfurter Zeitung*, dealing with this question, it is stated that the problem as to whether the great and old-established wood distillation industry in Germany is on the road to ruin has occupied public attention since the synthetic products appeared in the home and foreign markets, particularly in regard to synthetic methyl alcohol (methanol) and acetic acid.

For the present, states the writer, the contest is latent, as difficulties have been provisionally bridged over by the agreement entered into by the I. G. with the representatives of the wood distillation industry. The I. G., which is also a member of the acetic acid syndicate, is bound through the latter by an agreement regarding the market until the end of 1929. In the case of methanol and its utilisation, the arrangements are for a shorter period, running from year to year. Security for the continued existence of the works operating according to the wood distillation process, which at one time occupied a high rank in German industry, is consequently only given in a very limited manner by contract arrangements, if in reality the synthetic products should prove so superior as regards cost of production and quality as to affect the working economy of the old method.

No Definite Movements

The importance of the interests involved is shown by the fact that the Verein für Chemische Industrie (of Frankfort-on-Main) alone comprises ten inland works, that the Holzverkohlungs Industrie of Constance, which also has international manufacturing interests, likewise combines a large number of works, and that the existence of these big undertakings is bound up with the competitive ability of the old process. It seems that those associated with the wood distillation industry have as yet formed no clear idea concerning coming developments, and only the heavy depression in the share quotations shows that unrest has arisen in interested circles, while capitalists who have been connected with the works for decades past by means of share holdings have either disposed of their shares or are now doing so, as the great power of the chemical trust affects the market for these shares. In the opinion of the writer in the German paper, it is difficult to say how far the feeling thus manifested is justified, particularly as the companies engaged on the old process of distillation have hitherto been very cautious in their statements. The last annual report of the Verein für Chemische Industrie said very little regarding the competitive conditions, and little information was given at the general meeting. It was merely mentioned that the prices of the products had in part greatly fallen as compared with the previous year, though the turnover had been on the level of that in 1924; part of this turnover was due to the quantity of methanol which the Verein, in conjunction with the Holzverkohlungs Industrie, had taken over from the I. G. for the first time. This hint throws light on an interesting matter; it hints at the close connection between the makers of the synthetic and the distillation product which has developed under various agreements.

The Question of Amalgamation

The amalgamation of the leading wood distillation companies as a counter-stroke to the formation of the I. G. has not occurred because of the difficulty of reaching an understanding concerning the valuation of assets and the method of fixing an interchange of shares, and the question of a fusion is still at a deadlock. It is still doubtful whether the possible economies, concentration of production and the discontinuance of operations at certain works, likely to result from an amalgamation, would enable the industry to combat the synthetic products. The questions which arise are: Under what conditions does the I. G. produce, how high are its costs of production in the case of methanol and acetic acid, and can the synthetic products in every case fully replace in value the natural products obtained by way of distillation? The distillation products seem to be preferred in certain markets and for certain purposes, while the synthetic products are given the preference elsewhere.

The wood distillers naturally dispute an unconditional superiority of the synthetic products, and the present working agreement with the I. G. and the agreement with the various raw material industries appears to confirm this view. Moreover, it is in favour of the wood distillers that in many foreign countries, where they are working, their production and sales are protected in a certain measure by Customs duties. Wood distillers further lay emphasis on the fact that the development of their process has by no means come to an end. Possibilities of decisive reduction in costs and the further working up of the pure products and the charcoal exist. They also claim that they do not restrict themselves to the production of methanol and acetic acid and that the financial proceeds therefrom are not alone the determining factor for the existence of the industry. As to the special importance of the price of wood it is mentioned that this constitutes about two-thirds of the total cost, and that the price is about 80 per cent. above the pre-war level, although it is falling. Possibly the two products (synthetic and natural) may continue to exist side by side.

The I.G.'s Line of Action

Nevertheless it seems that the wood distillers have not yet reached a decision as to how the market will develop in the future. It is probable that the I. G. in the long run will scarcely restrict itself to working slowly. Within the scope of its entire production methanol and acetic acid play no such important part as they do in the case of the wood distillation industry; but these branches of the I. G.'s activity can be developed, as for instance in America. It is generally agreed that the production of methyl alcohol is capable of great development; and that the installations established by the I. G. are in a position to be expanded to enormous centres of production, which would be able to meet all requirements, without the necessity for incurring much more expenditure. If this is so, then the large reserves still at the disposal of the wood distillers should not be consumed in unfruitful work. At present a moderate return is still available to them under the protection of the price agreements. A possibility of better

utilising the charcoal which is formed in the process of wood distillation should not be very far off, having regard to the progress made in the investigation of coal and charcoal, although the last annual report of the Verein für Chemische Industrie referred to the inadequate Customs protection, particularly in relation to Czecho-Slovakia, and in connection therewith to the unsatisfactory sale of charcoal.

Charcoal for the treatment of gases and vapours is produced by the I. G. from peat. After quoting the views of an expert on this matter the German writer draws the conclusion that even a better disposition of charcoal would not afford decisive relief to the wood distillation industry, so that it is all the more necessary for the latter quickly to reach a decision in the present crisis.

Further Views from Berlin

Further details regarding the German methanol industry are given by the Berlin correspondent of *Chemical Markets* (New York), who says :

" Accurate information on the methanol situation is hard to obtain on account of the reticence of those most intimately concerned. Of course, methanol is continually on the market. Since, however, the I.G. concern some time ago came to an understanding with Holzverkohlungs Industrie Aktiengesellschaft, or the Wood Carbonisation Corporation, both companies sell methyl alcohol ; it is therefore impossible to determine whether the methanol sold by any one of these originates in wood distillation or synthetically. The two concerns presumably operate according to some agreed distribution percentage, with the definite object of confusing the outsider.

" The general question of methanol in connection with and parallel to the Bergin process for the manufacture of artificial petroleum products is a different matter. Here as well as in England comprehensive experiments have been carried on ; it is reported that the English Bergin Co. has already appropriated $125,000 for this purpose. The yield resulting from this process is so wide that the world prices for oil would need to decrease forty to sixty per cent. before the Bergin process would be unprofitable. In view of the enormous interest of the Standard Oil and Royal Shell it is obvious that these firms manifest a lively interest in the process, especially for methanol, since these patents have been issued, which is not the case with the oil patents. Although the comparatively high price of methanol has until recently interfered with its general use for motors, the question of economic use now seems to be solved. It is said that a new large plant with a daily capacity of 1,000 tons is being built in Bitterfeld. It apparently seems that the I.G. considers this product of special value."

Honour to Joseph Priestley

To the Editor of THE CHEMICAL AGE.

SIR,—American chemists have just paid another official visit to the grave and old house of Dr. Joseph Priestley, F.R.S., at Northumberland, Pennsylvania, the first visit being in 1874 when 74 attended and the American Chemical Society was founded. During the war some graduate chemists of Pennsylvania University acquired the house and handed it to a trust, which will preserve it along with some personal effects and laboratory appliances, some of which Mrs. F. Priestley Forsythe, a great granddaughter of the chemist, has assisted to collect.

Several very interesting relics of Dr. Priestley were shown on the stand of Reynolds and Bransom at the Leeds Tercentenary Exhibition, and these might well be made a permanent exhibit at the museum, so that visitors to Leeds could see them at any time. When Dr. Priestley was carrying out his investigations into the constitution of the gases we now call carbon dioxide and carbon monoxide, which led to his discovery of oxygen in 1774, he was living in a house adjoining the old brewery in Meadow Lane, which is now used by Tetley's as a maltkiln. May I suggest that those who are specially interested in chemistry in the West Riding should emulate their confrères in America and erect some memorial near the site where the " Father of Modern Chemistry " started his researches ? This might take the form of a tablet on the open space at the end of Charlotte Street, or, if sufficient funds were forthcoming, a medical clinic where ultra-violet ray treatment could be given.—Yours, etc.,

E. KILBURN SCOTT.

38, Claremont Square, N.1. September 13.

Smoke Abatement

Papers at the Birmingham Conference

THERE was a representative attendance of public officials and fuel technologists at the four-days' conference last week at Bingley Hall, Birmingham, on " Smoke Abatement," under the auspices of the Smoke Abatement League of Great Britain. On Thursday, September 9, questions of some interest to industrial chemists and chemical engineers were raised in papers given by Dr. Margaret Fishenden (for the Fuel Section of the Society of Chemical Industry) and Mr. A. S. E. Ackermann. They were concerned with the " Smokeless Production of Heat and Power."

Dr. E. W. Smith (hon. secretary of the Fuel Section of the Society of Chemical Industry) described Dr. Fishenden as the first lady technological fuel expert in the country. He declared that the advocacy of smoke abatement could not be left in the hands of the ordinary householder. There was need of an organisation which should be officially representative of the electrical, mining, coke-oven and gas industries, and of fuel technologists and economists.

Dr. Margaret Fishenden spoke on " The Outlook for Smokeless Domestic Heating." It had, of late, she observed, repeatedly been stated that on account of the escape of by-products and of their contaminating effects upon the air into which they emerged, the burning of bituminous coal in its raw state should be altogether discontinued, the proper course being first to subject it to some form of preliminary treatment whereby the distillation products might be conserved and the smoke producing constituents thus eliminated, or whereby it might be transformed into some form of energy which could be used without smoke emission. Many such processes were available whereby coal can be converted more or less completely into gas, coke, and oils in various proportions, or into electrical energy ; but their development must naturally be dependent upon the commercial possibilities which were presented. At the present time the most important of such processes were included in electricity generation and in the various systems of carbonisation. But recently, methods for the liquefaction of coal (the Bergius process) and for the conversion of water gas, produced from coke, into liquid fuels had come into prominence ; and although these had not yet been developed commercially, their possibilities in regard to future oil production were of great interest. Of all forms of energy into which the potential heat of coal could be converted, electricity was the most convenient on account of its cleanliness, adaptability, and ease of control ; but, unfortunately, it was also that form of energy in the production of which the wastage of the heat of the coal was most serious.

The solid fuel produced by carbonisation at low temperatures was particularly well suited to domestic requirements, but owing to the limitation of the temperatures to which the coal was heated, the gaseous matter was less completely extracted from it and a higher proportion was retained in the coke.

In his paper on " The Engineering Aspect of the Problem," Mr. Ackermann urged that powdered fuel was an aid to economy and absence of smoke and facilitated dealing with a fluctuating demand for steam. As to stoking, a bonus might be given with advantage for the absence of smoke with a high percentage of CO_2. Oil fuel was effective in some cases, but if improperly used made a particular black smoke. In regard to other kinds of power, it was probably a fallacy to think that very little water power was available in Great Britain, for the amount was probably not less than 500,000 h.p. Assuming 300 days of 12 working hours, this represented a saving on coal of over £1,500,000 per annum. There were places in the Empire, in Egypt, America, and even in Europe where plants utilising the sun's heat could be usefully erected.

A wicked waste of heat, and therefore coal, was taking place at gas works on account of the very high temperature at which flue gases were discharged from the retort furnaces. The obvious thing to do was to place an electric light works on top, so to speak, of the retort house of every large gas works. It was a pity that a certain natural antagonism between gas and electricity companies had so far probably prevented this from being done. An enterprising financial group was needed to start a new company which should supply both gas and electricity, then we should have an efficient combination and a great saving of coal.

British Research on Cotton

Meeting of the Research Association

THE seventh annual meeting of the British Cotton Industry Research Association was held on Tuesday in Manchester, Mr. Kenneth Lee, chairman of the Association, presiding.

The Chairman said that at the Shirley Institute, Didsbury, where the research work of the Association was carried on, the research staff, including those in the workshops, now numbered 92, of whom 44 were university graduates, and the work accomplished at the Institute during the last twelve months had been greater than at any period since the foundation of the Association. The subjects of investigation comprised nearly all of those in the original programme, and investigations into several of the problems had been completed. Accumulation of fundamental facts was now leading to their application to trade purposes. At the request of the Federation of Master Cotton Spinners Associations they had undertaken an investigation into the moisture regain of cotton, but as this required investigation under all the varying atmospheric conditions it must obviously take a considerable time. During the year the staff had continued the lectures in the lecture hall of the Federation and had also given about thirty evening lectures to the trade and others interested in it.

Empire Cotton-Growing

After expressing the hope that firms engaged in the various branches of the cotton industry would extend more invitations to the staff of the Institute to visit their mills and works and discuss their problems with them, and that, on the other hand there would be a larger number of visitors to the Institute on the "open" days, Mr. Lee said that their co-operation with the Empire Cotton Growing Corporation, which included, amongst other things, the spinning of and pronouncing on the merits of various Empire cottons, had been made more comprehensive. They were now receiving cotton experts from the Colonies at the Shirley Institute. These visitors stayed for two or three weeks, and last year included representatives from India, Uganda, Nigeria, Tanganyika, Egypt, and Australia. They were given the benefit of the staff's knowledge on the measurements and properties of cotton which most interested them, and were also entertained at members' mills; and they undoubtedly found the visits of great value. Eight Empire Cotton Growing Corporation students had been given the usual fortnight's instruction this summer before being sent abroad. It was also noteworthy that there was a marked increase in the number of technologists and research workers from within the industry who took advantage of any facilities of going to the Institute for assistance and training in special points of technique.

At the last annual meeting he had referred to the many inquiries from members regarding the utilisation of artificial silk and to the appointment of a special artificial silk subcommittee, which was to prepare a draft programme dealing with specific research problems. Since that time the whole matter had been under careful consideration and a proposal had been made that an artificial silk department of the Institute should be formed to carry out research work on the utilisation of artificial silk in conjunction with cotton. This department would be financed quite independently. The Council had decided that the cotton programme should not be interfered with whether work on artificial silk was taken up or not. It was estimated that the new department would necessitate a capital outlay of from £5,000 to £6,000 for buildings, and an annual expenditure of £2,000 to £3,000. Negotiations were now taking place with the object of ascertaining whether sufficient support would be forthcoming to justify going on with the project. Dealing lastly with the accounts, Mr. Lee said that during the last year the expenditure amounted to £48,101, as compared with £44,366 in the previous year, and the income to £37,459, as against £39,412. The reduction in income was due to their having received £3,000 less from the Department of Scientific and Industrial Research. Altogether they spent £10,643 more than was received as ordinary income. The deficiency was made up from the Cotton Trade War Memorial Fund grant, and as this grant amounted to £20,000 the assets showed an increase of £9,357. Finally, in thanking the director and the members of the staff, Mr. Lee said that since the Association was founded an enormous amount of scientific research work had been undertaken. He was now satisfied that the time was coming when the industry would reap continuously greater advantages as a result of these six years of work. Under Dr. Crossley's direction and with the guidance of the Council and various committees they had laid a solid foundation of knowledge which, with further work, would certainly lead to results of importance for every branch of the trade.

The Director's Report

Dr. Crossley, in his report—which was read for him, as he was not well enough to be present—gave a detailed description of the work done in the various departments of the Institute. The problem of yarn staining of conditioned ring yarns had now been almost completely worked out. It had been shown that the bacteria responsible for the staining increased enormously in numbers in the conditioning water as dipping proceeded, and that these numbers could be kept down successfully if formalin were added to the conditioning water. As a result of treating the hair with various dyes, it had been possible to develop a method—the Congo red method—for demonstrating the amount of damage, or tendering, suffered by cotton fibres under the action of mildew, heat, or acid, or under mechanical damage. This method had proved of considerable assistance in the examination of cases of tendering. It had, for example, been the means of enabling it to be shown that in yarn breakages the break took place mainly by rupture of the individual hairs, and not by slipping of the hairs over one another. This method was also being applied in the investigation of the question of damage to cotton at different stages of spinning and manufacture. In the investigations into sizing the dependence of the properties of a warp or a piece of cloth on the conduct of the sizing had been further examined. Good progress had been made also in investigations into the action of acids and oxidising agents on cotton.

A more extended examination of the influence of a number of mechanical and chemical factors on the tendering of cotton yarn by light had led to the general conclusion that any treatment which increased the strength of the unexposed material also increased its resistance to light. Bleaching led to an appreciable loss of strength by singles cotton yarn, and bleached yarn was proportionately more weakened by exposure than was the grey yarn. The susceptibility of tendering of mercerised cotton was apparently much the same as that of unmercerised, while doubled yarns were rather variable in behaviour as compared with singles, though from the point of view of the residual strength of material which had suffered a long exposure, one end of doubled yarn was superior to two of the singles. A comprehensive programme of research had been carried out on the effect of humidity on warp yarns, sized and unsized, of several qualities, and the series results so far obtained had been reported to the Home Office Committee on humidity in weaving sheds and would be laid before members of the Association shortly.

The report and accounts were adopted. Mr. H. S. Butterworth was elected to the Council in place of the late Mr. W. Greenwood and Mr. G. E. Holden in place of Mr. E. Dyson. Messrs. A. Birtwistle, S. Bourne, Forrest, Hewit, A. W. Heyworth, T. Nuttall, W. J. Orr, W. H. Pennington, H. Roberts, F. Scarisbrick, and F. Wright, retiring members, were re-elected, and Messrs. Arthur Eastwood and George Whittaker were added to their number. David Smith, Garnett, and Co. were reappointed auditors.

Special Libraries Conference

THE Association of Special Libraries and Information Bureaux is holding its third conference during the week-end, September 24–27, at Balliol College, Oxford. The Right Hon. the Viscount Burnham will speak at the opening dinner. Several papers on various problems affecting the collection and distribution of information are to be given by members of the chemical industry, including "The Transformation of Files of Data into an Active Service," by Dr. S. S. Pickles; "Information Bureaux," by R. Borlase Matthews; "Instruction in Bibliographical Technique for University Students," by Harold E. Potts; "The Distribution of Technical Literature," by Principal J. F. Hudson; and "A National Information Service," by J. G. Pearce. The Conference is open to all interested, but as the accommodation is strictly limited, those wishing to attend should communicate without delay with the Secretary of the Association at 38, Bloomsbury Square, London, W.C.1.

Chemical Trade Returns for August

Exports and Re-Exports Down: Imports Up

WHETHER comparison is made between the months of August, 1926, and August, 1925, or between the first eight months of this year and the corresponding period of last year, the Board of Trade returns for August relating to chemicals, drugs, dyes, and colours, reveal a decrease in both exports and re-exports and an increase in imports.

Taking the monthly comparison first, imports have increased £192,178 over August of 1925 (from £1,053,339 to £1,245,517); exports have decreased £210,127 (from £1,739,567 to £1,529,440); re-exports have decreased £28,259 (from £99,324 to £71,065).

A comparison between the first eight months of this year with the first eight months of last year exhibits the same tendency. Imports have increased £350,769 (from £9,710,060 to £10,060,829); exports have decreased £962,778 (from £16,132,302 to £15,169,524); re-exports have decreased £149,687 (from £845,405 to £695,718).

Details of the chemical figures are given below :—

Imports

	Quantities. Month ending August 31.		Value. Month ending August 31.	
	1925.	1926.	1925. £	1926. £
CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid Acetic ..... tons	565	763	28,707	36,910
Acid Tartaric .....cwt.	3,624	4,203	17,483	20,539
Bleaching Materials ,,	7,869	8,639	6,043	7,666
Borax..... ,,	7,200	4,350	8,561	4,966
Calcium Carbide... ,,	60,221	44,863	40,332	28,524
Coal Tar Products. ,,	—	—	69,593	253,998
Glycerine, Crude .. ,,	316	—	953	—
Glycerine, Distilled ,,	206	2	785	8
Red Lead and Orange Lead ..... ,,	2,289	2,901	4,457	5,488
Nickel Oxide..... ,,	2,022	99	11,297	418
Potassium Nitrate. ,,	6,314	9,046	7,670	9,473
Other Potassium Compounds..... ,,	70,758	73,602	32,564	40,061
Sodium Nitrate ... ,,	183,680	21,640	113,459	13,044
Other Sodium Compounds..... ,,	19,631	35,876	14,899	21,925
Tartar, Cream of.. ,,	3,624	4,687	12,671	16,085
Zinc Oxide ..... tons	886	951	29,629	32,987
All other Sorts .. value	—	—	182,530	267,767
DRUGS, MEDICINES, etc.—				
Quinine and Quinine Salts ..... oz.	84,536	146,583	8,730	10,589
Bark Cinchona.... cwt.	1,397	14	6,164	75
Other sorts.....value	—	—	116,412	120,842
DYES AND DYESTUFFS—				
Intermediate Coal Tar Products ..... cwt.	398	—	3,939	—
Alizarine ..... ,,	153	97	3,458	3,131
Indigo, Synthetic.. ,,	—	—	—	—
Other Sorts ..... ,,	2,312	2,723	54,546	71,506
Cutch ..... ,,	6,339	3,683	11,952	6,058
Other Dyeing Extracts cwt.	2,290	3,278	8,241	11,141
Indigo, Natural ... ,,	—	81	—	2,120
Extracts for Tanning ,,	99,522	90,943	93,086	89,012
PAINTERS' COLOURS AND MATERIALS—				
Barytes, ground .. cwt.	70,142	65,821	16,068	16,040
White Lead, dry .. ,,	17,992	18,152	35,772	34,887
All other Sorts .... ,,	106,840	78,341	113,338	120,257
Total of Chemicals, Drugs, Dyes and Colours....value	—	—	1,053,339	1,245,517

Exports

CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid Sulphuric....cwt.	2,995	1,337	3,100	1,689
Acid Tartaric ..... ,,	974	1,643	5,387	8,745
Ammonium Chloride tons	215	253	6,760	5,495
Ammonium Sulphate—				
To France ..... ,,	490	—	5,635	—
Spain and Canaries.... ,,	8,676	3,078	99,812	33,833
Italy..... ,,	297	95	3,861	1,185
Dutch East Indies,,	1,404	273	17,600	3,019
Japan..... ,,	3,882	2,655	46,526	29,322
British West India Islands (including Bahamas) and British Guiana .. ,,	1,396	429	17,688	4,802
Other Countries ,,	3,837	4,227	45,828	47,088
Total ..... ,,	19,982	10,757	236,950	119,249
BLEACHING POWDER.cwt.	17,865	16,449	8,947	8,015

	Quantities. Month ending August 31,		Value. Month ending August 31,	
	1925.	1926.	1925. £	1926. £
COAL TAR PRODUCTS—				
Anthracene ..... cwt.	1,969	2,043	985	1,512
Benzol and Toluol.galls.	1,753	725	249	82
Carbolic Acid .....cwt.	9,173	6,114	13,099	9,984
Naphtha ..... galls.	4,873	1,343	514	208
Napthalene .....cwt.	531	1,481	426	973
Tar, Oil, Creosote Oil, etc. galls.	2,537,925	1,537,126	80,214	49,367
Other Sorts ..... cwt.	37,800	28,440	20,062	17,136
Total ....value	—	—	115,549	79,262
COPPER, Sulphate of..tons	468	470	9,915	10,819
DISINFECTANTS, INSECTICIDES, etc. ....cwt.	30,698	25,106	76,599	62,756
Glycerine, Crude .... ,,	1,673	5,756	4,338	20,114
Glycerine, Distilled .. ,,	5,070	12,153	19,695	58,407
Total .... ,,	6,743	17,909	24,033	78,521
POTASSIUM COMPOUNDS—				
Chromate and Bichromate .... cwt.	1,073	1,320	2,030	2,492
Nitrate..... ,,	656	651	1,440	1,300
All Other Sorts.... ,,	1,367	565	12,650	9,510
Total .... ,,	3,096	2,536	16,120	13,302
SODIUM COMPOUNDS—				
Carbonate.....cwt.	382,642	436,256	117,044	132,108
Caustic..... ,,	172,820	120,091	109,254	88,630
Chromate and Bichromate ..... ,,	2,259	3,713	3,761	5,295
Sulphate, including Salt Cake..... ,,	127,431	52,367	18,296	8,189
All other Sorts .... ,,	44,965	46,436	79,287	65,075
Total .... ,,	730,117	658,863	327,642	299,297
ZINC OXIDE .....tons	110	89	4,436	3,984
Chemical Manufactures, etc., all other sorts.value	—	—	304,768	229,747
Total of Chemical Manufactures and Products value	—	—	1,140,206	920,881
DRUGS, MEDICINES, etc.—				
Quinine and Quinine Salts ..... oz.	157,727	134,221	21,443	11,332
Opium ..... lb.	314	95	529	136
All other Sorts....value	—	—	217,977	226,502
Total .... ,,	—	—	239,949	237,970
DYES AND DYESTUFFS—				
Coal Tar Products.cwt.	7,452	3,373	57,728	34,525
Other Sorts..... ,,	4,450	5,837	5,817	6,769
Total .... ,,	11,902	9,210	63,545	41,294
PAINTERS' COLOURS AND MATERIALS—				
Barytes, Ground .. cwt.	946	2,158	454	1,162
White Lead (dry).. ,,	9,268	3,811	20,583	8,093
Paints and Colours, ground in Oil or Water ..... ,,	36,646	47,037	86,178	109,232
Paints and Enamels, Prepared ..... ,,	29,743	33,339	90,954	104,421
All other Sorts .... ,,	47,162	54,896	97,698	106,387
Total .... ,,	123,765	141,241	295,867	329,295
Total of Chemicals, Drugs, Dyes and Colours ..... value	—	—	1,739,567	1,529,440

Re-exports

CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid Tartaric ..... cwt.	63	147	442	790
Borax..... ,,	40	—	50	—
Coal Tar Products value	—	—	97	1,465

	Quantities. Month ending August 31, 1925.	1926.	Value. Month ending August 31, 1925. £	1926. £
Glycerine, Crude .. cwt.	234	—	621	—
Glycerine, Distilled ,,	—	—	—	—
Potassium Nitrate ,,	69	34	98	62
Sodium Nitrate ... ,,	3,288	472	2,127	337
Tartar, Cream of .. ,,	140	236	767	1,022
All other Sorts....value	—	—	14,870	10,895
DRUGS, MEDICINES, etc.—				
Quinine and Quinine Salts..... oz.	10,050	13,852	1,456	1,520
Bark Cinchona.... cwt.	151	66	802	309
All other Sorts....value	—	—	42,231	46,442
DYE AND DYESTUFFS—				
Cutch ..... cwt.	2,808	905	4,491	1,343
All other Sorts .... ,,	234	603	1,857	2,496
Indigo, Natural ... ,,	40	—	1,011	—
Extracts for Tanning ,,	22,206	446	22,862	653
PAINTERS' COLOURS AND MATERIALS ..... ,,	1,857	896	5,216	3,204
Total of Chemicals, Drugs, Dyes and Colours .....value	—	—	99,324	71,065

Rationalised Trade Unionism

A Manchester Experiment that May Lead the Way

A FULLER examination than was possible last week of the remarkable agreement just completed between the company owning the *Manchester Guardian* and the *Evening News* and the staff in the service of the company reveals features of unusual interest to all engaged in the direction of industry or concerned with the serious study of industrial organisation. While disclaiming any hostility or even weakening of faith in the principle of trade unionism, the authors just as frankly confess that they see nothing sacred in the particular manner in which trade unions are at present constituted.

A difference, however, in the methods of applying a principle may be so wide as almost to represent opposing principles, and that is probably not far from being the case as between the "national" theory and practice of trade unionism as it exists to-day and the localised and, as we have ventured to suggest, rationalised trade unionism of the Manchester agreement. If adopted universally, the agreement would revolutionise existing trade union practice; if adopted widely it would profoundly modify it; even in one single case, it is an experiment that must set people thinking out a re-statement of their faith. It is for these reasons that it may be well to set out some of its more notable features.

1.—Local Autonomy in Place of Mass Control

The foundation principle of the Manchester agreement is embodied in the first two clauses, under which the employing company on the one side and the employed staff through their own society on the other, while still belonging to their respective federation and workers' unions, mutually contract not to enter into any obligations that conflict with their liabilities the one to the other. Thus, at one step, a domestic, internal or "house" autonomy is established, both for employers and for employees, which supersedes external mass control either by employers' federations or by the workers' trade unions.

It is true that, for the moment, this does not abolish national standards of wages and conditions. On the contrary, account is to be taken of such standards; in determining wages and hours, for example," the arbitrator must have regard to those prevailing nationally in accordance with trade union agreements." But a vital change is really introduced. While the national organisation may set up a national standard it no longer enforces it automatically on all local units. The latter—the "society" in the Manchester agreement—is permitted discretion in arranging terms for itself; it exercises a selective and rejective function hitherto denied it. The national organisation changes from a mandatory into an advisory body; the individual "house" organisation, which formerly had merely to obey orders from headquarters, becomes the executive authority.

In a word, the power of national dictatorship that lies behind national agreements and national strikes disappears and is replaced by local "house" autonomy. While the principle of trade unionism remains, its application is placed on a fundamentally different basis. One can imagine that the immense vested interests embodied in national headquarters, staffs, and organisations will not welcome the change.

2.—The Recovery of Craft Unity

Scarcely less important is the changed relation that the agreement establishes between the various craftsmen engaged in a single business. At present, even in relatively small offices or businesses, the workers are split up into sections and fragments, each under its separate external control, and any one capable more or less of bringing the common work to a standstill. The present system, as the authors of the agreement put it, "accentuates the divisions between workers of different departments or grades, and thereby obstructs co-operation and weakens the sense of responsibility for the efficient conduct of the industry in which they are engaged."

Under the Manchester Agreement, all the workers in a single undertaking become one community, with closer and more compact relations to one another than to any outside authorities. This is surely the true relation in which fellow-workers should stand towards one another and towards the industry which they all serve and by which, equally with employers, they all live. It is the only right because the only natural relation between those whose daily work would be impossible without the most intimate and constant co-operation and interdependence. And as the communal or family bond between themselves is strengthened, so the old conflicting and divisive loyalties to a score of remote external and impersonal dictatorships must be proportionately weakened.

Again, from the headquarters' point of view, the change will not be welcome, but two gains should result. The family life of every business undertaking should be strengthened and unified. The business itself will gain by the direct interest of the workers and by their personal sense of joint responsibility for its prosperity.

3.—Settlement by Reason Instead of Force

From some aspects, perhaps the greatest feature of the agreement is the definite abandonment of the strike in favour of arbitration. The right to strike, it is fairly argued, is the workers' final protection against exploitation. But, like war, its only excuse is when all other resources are exhausted. The necessity of resorting to a settlement by force disappears the moment that adequate guarantees and machinery are provided for securing a settlement by reason.

Here, we have the promise of a real advance. Both parties to the agreement recognise that the strike, hitherto the hallmark of orthodox trade unionism, is "a rusty weapon, becoming as obsolete and in its degree as dangerous as war." The intention of the agreement on both sides is to substitute for the crude appeal to force that every strike really is, an intelligent appeal to reason—consultation and discussion, first, between the parties themselves, and then, failing agreement, a reference to an independent and impartial authority by whose findings they agree to be bound. Could anything be more rational or better calculated to bring mutually satisfactory results?

4.—Mutual Guarantees and Gains

But, it may be asked, what does the worker gain by abandoning the strike and by making himself responsible for the success of the business? First, by securing the success of the business in which he is engaged he ensures his own livelihood, with the prospect of better wages and conditions. He is guaranteed under the agreement against capricious or vindictive dismissal; in the case of grievance he has a right roughly resembling the right of trial by jury. He is guaranteed a non-contributory

pension at the age of 65, or a capital sum by way of compensation if he should leave or retire before, and various other financial provisions. He is, in fact, under the Manchester agreement, almost as well placed as the Irish "C.C.C." parsons, who when disestablished and disendowed "commuted, compounded, and cut," and then proceeded to acquire a fresh life interest in some other province. The financial provisions of the Manchester agreement represent the worker's vested interest in the business, and their natural effect would be to induce him to remain with the same firm.

While the financial details of the Manchester scheme seem generous, it may be noted that no provision is made for co-partnership or any direct interest as actual shareholders. The proprietors of this journal have for some time encouraged the staff, by the offer of specially favourable terms, to become shareholders in the company, and thus to identify themselves in the closest personal way with the business. It is the way that has done so much to secure America against the disastrous disputes that arrest business developments here. As a member of the U.S.A. Department of Commerce staff remarked to us recently, the American worker who has a holding in the business at which he works, feels himself a part of the business, and regards the "boss" as a colleague rather than an employer. The Manchester agreement does not include this feature, but the interests it offers the staff are nevertheless substantial.

What do the company gain on their side? Their greatest gain is "protection against the constant menace of stoppage." Freed from the strike threat, they can plan reasonably far ahead and undertake developments which depend on security and confidence. The guarantee looks a good one, for it is mutually agreed that in no circumstances shall any action be taken by the Society—that is, by the staff—or its members or agents, whether by breach of contract or otherwise, calculated to hinder or prevent the normal production and distribution of the company's newspapers. Such action will be deemed to constitute "grave misconduct"—the one ground in the whole agreement justifying dismissal and the forfeiture of rights and benefits on the part of the worker. Thus loyalty is encouraged by substantial gains and disloyalty discouraged by heavy sacrifices.

5.—Will It Work?

We imagine that the official element in trade unionism will not like the scheme. "Unity," they will argue once more, "is our only strength. Divide the workers into little groups, break down the habit of collective national action, destroy the existing class cohesion, weaken the central power and authority, and Capitalism will presently have us again at its mercy." It is not an unnatural argument. The answer is that employers are learning as well as the workers. To the one as much as the other peace and co-operation are essential. If the employing class entered upon a policy of reprisals the moment the workers had surrendered their present defences, it would merely be starting another round of the old vicious circle. Any breach of faith on their part must ultimately produce a more determined and disastrous hostility. The best guarantee of the employers' good faith is that it is to their own interest. They have had enough of strife; their own salvation lies in secure and productive peace.

Waterproof Paper-lined Bags

THAT waterproof paper lined bags are rapidly increasing in importance in the shipment of chemical products is evidenced by the fact that calcium chloride, a substance that rapidly absorbs moisture, and is employed in many instances because of this property, is now shipped in these bags without absorbing moisture. This material was previously shipped almost entirely in destructible drums. Among the other products that are shipped satisfactorily in these containers are the following:—Aluminium flake, barium chloride, bicarbonate of soda, borax, casein, clay products, copperas, copper sulphate, crystallite, Epsom salts, fluorspar, Glauber's salt, ground ferro alloy, hydrated lime, sodium hyposulphite, insecticides, iron oxide, lead oxide, molybdenum, vanadium oxide, phosphate, powdered drugs, powdered iron, silica, silicate of soda, sodium sulphate, soda ash, stearates, stearic acid, sulphate of alumina, sulphur zinc concentrate, zinc ore, zinc sulphate, magnesium chloride, ochre.

Chemicals in Russia

Figures for Production and Imports

SOME important official figures have recently appeared giving details of the progress of chemical industry in Russia, and of the chemical imports from European countries. The following account is based on an article on the subject which has just appeared in the *Chemiker-Zeitung*.

The number of chemical workers in Russia in the working year 1924–25 was 58,434, and for 1923–24, 44,119, the number for 1924–25 being 82·5 per cent. of the 1913 figure. The total value, based on pre-war prices, of the products was about 251,000 roubles, or 74·2 per cent. of the 1913 value, each worker producing to the value of about 90 per cent. of the worker/production value in 1913. The production is rising. As far as the fundamental chemical industries (acids, alkalis, superphosphates and salts) are concerned the most rapid development is shown by superphosphates, which in 1924–25 reached 99·2 per cent. of the pre-war total. The slowest development has occurred in the production of salts, which have reached only 57 per cent. of pre-war, while acids and alkalis have attained to 75 per cent. of pre-war. The rubber industry increased its output in 1924–25 to nearly three times the 1922–23 value, in spite of a setback in the intervening year. The production of aniline and allied products was nearly twice that of the previous year. Owing to the great activity of the building trade, the demand for varnishes, paints, etc., expanded enormously, so that the output, although twice that of the previous year, was unable to cover requirements. The detailed production figures for 1924–25 were: varnish, 4,606 tons, dry colours, 12,174 tons, oil colours, 7,540 tons. Efforts are being made by the government to reduce the production of white lead by replacing it by zinc white.

As far as imports from Europe were concerned, figures are given for the periods October, 1924, to March, 1925, and October, 1923, to March, 1924. The total amount of chemical and pharmaceutical imports was 5,856 tons (6,849,000 gold roubles) in the first period and 2,695 tons (1,594,000 gold roubles) in the second. In these totals the first place in value is occupied by Germany with 3,942,000 roubles and 1,123,000 roubles respectively, followed by England with 1,289,000 roubles and 148,000 roubles. The great increase in imports from this country is noteworthy. The nearest competitors to Germany and England in the 1924–25 period were Holland with 675,000 roubles and France with 635,000 roubles. Some of the more interesting details of imports are given below:—

Substance.	October, 1924, to March, 1925. kg.	October, 1923, to March, 1924. kg.
Formic Acid	300,000	2,000
Inorganic Chemicals for Medical Purposes	623,400	117,000
Ethereal Oils and Synthetic Perfumes	93,800	20,700
Potassium Ferro- and Ferricyanide	116,000	136,000
Borax	146,000	198,000
Refined Boric Acid	67,000	116,000
Bromides of Potassium, Sodium and Ammonium	33,000	11,000
Camphor	9,000	2,000
Phenol	54,000	222,000
Chloroform and Chloral Hydrate	8,000	3,000
Citric Acid	195,000	55,000
Acetic Acid	1,000	300
Formaldehyde	303,000	100
Iodine	40,000	12,000
Potassium Nitrate	1,194,000	400
Copper Sulphate	1,000	36,000
Lactic Acid	14,000	9,000
Lactose	13,000	8,000
Sodium Nitrate	2,015	20,889
Opium Alkaloids, Atropine, etc.	2,300	800
Medicinal Organic Chemicals, Not Otherwise Specified	56,000	56,800
Oxalic Acid	133,000	61,000
Phenacetin	9,800	3,500
Phenylpyrazolone, etc	20,000	7,100
Potassium Carbonate	17,000	2,000
Mercury Salts	9,000	300
Resorcin and Hydroquinone	6,000	4,000
Tartaric Acid	135,000	43,000

Olive Oil Extraction

Proposed New Method

IN the current issue of the Italian oil industry journal (*L'Industria degli Olii e dei Grassi*) Professor Michele degli Atti points out that, in its general outline, the process of oil extraction from the olive has remained almost unchanged from the beginning, that is to say, it consists in first pulping the fruit and then extracting the oil by pressure. The same general method is followed in the extraction of fruit juices generally, such as the production of grape juice, for example. In such cases, however, one is dealing with the extraction of a homogeneous liquid, and with the mechanical aids now available the yield is comparatively high. But with the olive conditions are somewhat different, since the juices contained in this fruit consist of two liquids of very varied consistency from the physical point of view. The first is an aqueous solution of salts, acids, etc., whilst the other and considerably lesser constituent is a fatty substance, more or less viscous, and certainly much less fluid than the aqueous solution. When subjected to pressure the watery content passes out readily enough, but the more viscous oily matter does so only with difficulty and tends to block the press, especially towards the end of the operation, when the percentage of oil in the pulp is much greater than that of aqueous solution. Ultimately at least 10 per cent. of oil is left in the residue. Beside being inefficient, the process is costly, involving the use of high power and the necessity of subsequent extraction with solvents. Numerous attempts have been made to find a better and cheaper method, but so far, says Professor Michele degli Atti, with little success.

Variation of Constituents

Analysis of different samples of olives grown under different conditions shows that the main constituents vary within the following limits: water of vegetation (aqueous solution) 45 to 60 per cent., oil 25 to 30 per cent., solid organic matter 12 to 22 per cent. The total liquid portion therefore amounts to 80 or 90 per cent. of the whole, and of this two-thirds is aqueous solution and one-third oil. After removing the skin or endocarp, the fleshy portion is completely ground up, the oil cells being thoroughly broken so that all the juice is set free, and an unstable emulsion of fatty matter and water, containing a certain proportion of solid particles in suspension, is formed. The separation of the oily material from such an emulsion may, of course, be effected without the use of power. Such separation is all the more perfect in proportion to the completeness of grinding. This disintegration, however, is not to be confounded with mere pulping, since this pulp is really a mass of minute particles, including a considerable proportion of unbroken cells. If the disintegration is sufficiently thorough the emulsion formed may be merely left to settle and the oil may be decanted off.

Another Method

Another method is to place the pulp in cloth bags, in which case the oily matter passes out readily enough, whilst the organic solid matter and aqueous residue remains in the bag in the form of a semi-fluid non-filterable substance. It was further observed that if any pressure is applied, however slight, water passes out with the oil, the amount of water being proportionate to the pressure. This is explained by the fact that without pressure the fatty matter is expelled through differences in density, the water remaining fixed to the solid particles forming a semi-fluid mass. But if pressure be applied, this adhesion of the water to the solid particles is neutralised.

The author has endeavoured to apply these ideas in practice, and claims to have succeeded at least on a small scale; and notwithstanding the rough and ready methods employed he was able to obtain a yield of 18 per cent. olive oil, calculated on the total weight of the olives, as compared with the yield of 12·6 per cent. by the ordinary method. The advantages claimed for the new process are: (1) simplified mechanical means of low cost, (2) reduced labour costs, (3) production of perfectly pure filtered oil of uniform quality, and having all the qualities present in the original raw material, (4) high yield. It is hoped to publish further details. Meanwhile the cost of the experimental work of the last two years has been borne by the Ministry of National Economy and the Societa Nazionale degli Olivicoltori.

Possibilities of Atomic Energy

IN his presidential address to the American Chemical Society in Philadelphia last week, Dr. J. F. Norris declared that a third new epoch was opening for the world now that man was beginning to learn how to obtain and use energy with a high intensity factor, the energy tied up in the atom and electron. The use of heat as a form of energy began the first great epoch of man's mastery of nature; the use of electricity the second. Already, said Dr. Norris, results leading to discoveries of great usefulness had been secured through the employment of radiant energy, which would ultimately be obtainable free and in unlimited amounts. He cited as an example the laboratory production of methane, the chief constituent of natural gas. It had been made from carbon and hydrogen with the use of radium. Obtaining methane meant producing a supply of combustible liquid with which to run motor-cars when supplies of petroleum were exhausted. The discovery that ultra-violet rays would convert formaldehyde into sugar made it possible to see that foods in the future would be produced by synthesis, without the slow process of passing through the vegetable kingdom. That was only one of the many benefits which the new chemistry was destined to supply to man. He foresaw that in the next half-century knowledge of matter would be extended so broadly that what the world knew to-day would be but the foreground of an impressive picture.

American Chemists and Synthetic Rubber

THE general opinion expressed at the meetings of the American Chemical Society last week at Philadelphia at a rubber symposium was that they were without any hope of making up for the world scarcity in rubber by means of synthetic rubber. Up to the present no synthetic rubber had been made suitable for tyres. There were, however, three sources from which relief might be expected. The most promising was the rubber obtained from the guayule shrub in New Mexico, Texas and Southern California. Substituting other materials, not necessarily synthetic rubber, for raw rubber also promised to do much to relieve the scarcity. The third prospective source was reclaimed rubber. There had not been any real development in reclaiming rubber in 28 years; science had so far failed to find a way of reversing the process whereby rubber was vulcanised.

Dr. Whiteford, the expert of the Rubber Association of America, who has been making investigations in the prospects of rubber-growing in South America, has reported adversely on the possibility of new developments there. Brazil, he said, was the logical place to stimulate production, but the labour supply there was inadequate and the Brazilian Government would not enter into any agreement with capital that would justify investment in plantations.

A New Age of Alloys

DR. IRVING LANGMUIR, an authority on the structure of the atom, declared, during the meetings of the American Chemical Society, last week, that the discovery of the new atomic hydrogen flame process had opened up a new "age of alloys." With the heat of 8,000-9,000° F. now obtained, it was possible to weld combinations of metals which had hitherto resisted all efforts to fuse them, making stronger and more ductile alloys than had ever been made before. The process involved a dissociation of hydrogen molecules into atoms by the use of powerful electric arcs between tungsten electrodes, bathed in a gentle stream of hydrogen from a ring of nozzles surrounding the electrodes.

Oil Fire at Bootle

FIREMEN were called to an outbreak in the storage yard of the Dee Oil Co., in Earlam Road, Bootle, on Friday, September 10. Some oil-soaked shavings laying about, it appears, became alight and started a fire in two small oil barrels which by the time the brigade had arrived were blazing fiercely. The two barrels concerned were surrounded by 200 others filled with oil. The heat was terrific and there was great danger of the whole stock catching fire. After half an hour's work, removing barrels and pouring chemicals on to the fire, the brigade managed to stamp it out.

From Week to Week

RECENT WILLS INCLUDE: Mr. Thomas Robinson Brooke, of Chingford, Essex, manager of the British Xylonite Co., £11,821.

E. W. HAMPSHIRE AND CO., LTD., manufacturing chemists, have purchased 15 or 16 acres of land at Derby with a view to erecting new premises.

THE FINAL ESTIMATED INDIGO CROP for the 1925-26 season for Madras, Bihar and Orissa, United Provinces, Punjab, Bengal, Bombay and Sind (about 84 per cent. of total indigo area of India) is given as 129,200 acres.

THE SAFETY IN MINES RESEARCH BOARD has issued a pamphlet, by Mr. M. J. Burgess, dealing with the projection of flame as affecting the question of fire-damp explosions. The question is of special importance in relation to the sealing of gob fires.

DAMAGE ESTIMATED AT £1,500 was caused by fire on Thursday, September 9, at the Chapel Hill premises at Huddersfield of W. T. Hawkins and Co., cement manufacturers. The outbreak was caused by oil boiling over from a heating receptacle on to a gas stove.

THE CENTENARY OF CANNON IRONFOUNDRIES, LTD., is being celebrated to-day at Blackpool. The employees and friends of the firm are travelling by special train, and presentations will be made at a dinner in the Winter Gardens. Complete arrangements have been made for visiting all Blackpool's sights and entertainments, and the party will return by train, supper being served on the homeward journey.

PROFESSOR VERNON HERBERT BLACKMAN, Sc.D., F.R.S., Professor Frederick George Donnan, C.B.E., D.Sc., LL.D., F.R.S., and Professor Frederick Alexander Lindemann, Ph.D., F.R.S., have been appointed by Order of Council dated August 20, 1926, to be members of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research, in the place of members who have retired on the completion of their terms of office.

FROM SEPTEMBER 6, the address of E. G. Jepson and Co. (71, Albion Street, Leeds) has been changed to 5, Crown Point Road, Leeds. The firm have experienced some inconvenience in having their office separate from their works and warehouse, and as they have good office accommodation attached to their premises at 5, Crown Point Road, the concentration of their business there promises to be advantageous to themselves and their customers. Their telephone numbers remain "20827" and "20828," but their old number "25857" is cancelled.

A SERIES OF SIX POPULAR TALKS ON TRAVEL, SCIENCE AND INVENTION, with experimental demonstrations and lantern slides, has been arranged by the Propaganda Committee of the King Edward's Hospital Fund for London, to be held in London during October and November. All the speakers are giving their services free and the proceeds will be given to the King's Fund for the benefit of the hospitals of London. The subjects to be dealt with include "Liquid Air," by W. E. Garner, of University College, and "The Romance of Refrigeration," by Dr. Ezer Griffiths, of the National Physical Laboratory. Admission tickets may be obtained upon application to the secretary, King Edward's Hospital Fund for London, 7, Walbrook, London, E.C.4. The prices are 2s. 6d. per lecture, or 12s. 6d. for the series, numbered and reserved, 5s. each, or 25s. for the series.

THE GOLD MEDALS OF THE AMERICAN FOUNDRYMEN'S ASSOCIATION are to be presented to the following: Mr. John Shaw, of Sheffield, a past president of the Sheffield and Birmingham branches of the Institute of British Foundrymen and the third oldest British member of the American Foundrymen's Association, who is to receive the John A. Penton medal; M. E. V. Ronceray, of Thiais, France, recognised as being the foremost French foundryman, who will receive the J. H. Whiting medal; and Professor Thomas Turner, of the University of Birmingham, a British metallurgist whose work has been of great importance to the casting industry, who is to be presented with the Joseph S. Seaman gold medal. The Board of Awards selected these three men because of their prominence in European circles and their contributions to the advancement of the foundry industry.

APPLICATIONS ARE INVITED for the following appointments:—Head of the Department of Chemistry, Witwatersrand Technical Institute, South Africa. £450-£25-£650, plus local allowance. The Secretary, Office of the High Commissioner for the Union of South Africa, Trafalgar Square, London, W.C.2. September 30.—Adviser in Agricultural Chemistry, University of Durham (Armstrong College), Newcastle-upon-Tyne. £300 plus bonus. The Registrar. October 1.—Research Bio-Chemist in the Walter and Eliza Hall Institute of Research, Melbourne, Australia. Two years. £750. The Agent-General for Victoria, Victoria House, Melbourne Place, Strand, London, W.C.2. September 30.—Research Chemists for the Chemical Research Laboratory, Teddington, Middlesex. Good Honours Degree or equivalent and some research experience. £175-£15-£235 plus Civil Service bonus. The Secretary, Department of Scientific and Industrial Research, 16, Old Queen Street, Westminster, London, S.W.1. October 7.

THE DYERS' COMPANY has contributed £11,221 to the City and Guilds of London Institute since the guild's foundation 46 years ago.

DR. BOSCH, director-general of the I.G., and Messrs. Meer and Schmitz, director and financial director respectively, are reported to be visiting America in the near future.

TWO WORKMEN WERE KILLED in an explosion which occurred recently whilst a boat was being loaded with benzoline from one of the large storing tanks installed by the National Benzoline Co. on the Keadby (Scunthorpe) side of the River Trent.

MR. GEORGE HINDLE, the President of the Blackburn Chamber of Commerce, in a recent address expressed the view that if Britain were permitted to purchase its dyes in the open market as our competitors could do there would be more custom. The textile trade was unfairly handicapped in bearing the expense of establishing a dye industry.

THE MEMBERS OF THE AUSTRALIAN COUNCIL for Scientific and Industrial Research are to receive the following remuneration: Mr. G. A. Julius, chairman, £1,000 per annum; Mr. W. J. Newbigin and Professor A. C. D. Rivett, nominated members of the Council, £500 each per annum. Members of the Council other than those nominated, will receive £5 5s. a sitting, with travelling allowance of £2 2s. a day for each sitting.

A NEW CORPORATION under the name of Cia. General de Anilinas, with offices in Mexico City, has been formed by a combination of the Mexican sales organisations of the German dye cartel. General industrial chemicals will be handled by the Fabricas Unidas, formerly exclusive representative of the Afga Company, and Westcott y Cia., which has been representing Bayer, will carry all stocks of German pharmaceutical preparations.

ALFRED PERCY BROWN, 42, merchant, of Hart Hall Lane, King's Langley, Hertfordshire, was charged at Bow Street Police Court, on Monday, with forging and uttering a share certificate of the Lion Talc and Grinding Company, Ltd. Detective-Sergeant Baker, giving evidence, said that the principal witness in the case was attending a conference, and he applied for a formal remand until he could be present. The sum involved in the charge was £250. Brown offered no objection to a remand, and was remanded for a week, without any evidence being taken, bail in £50 being allowed.

MR. AND MRS. GEORGE WILKINSON, of The Gables, Haygate Road, Wellington, celebrated their diamond wedding on Saturday, September 11. Mr. Wilkinson was born in Birmingham in 1840, and came to Wellington, with his wife, in 1889. He became a partner in the chemical works at Stirchley, at the head of which was the late Mr. Thomas Groom, the business being carried on at present by Mr. Wilkinson and his son. He also erected and worked for many years a chemical works at Pontrilas, Herefordshire, and he is vice-chairman of the British Wood Distillers' Association.

DR. PAUL SABATIER, Professor of Chemistry in the University of Toulouse, and Nobel prizewinner in chemistry in 1912, received a cheque at an international ceremony held on Wednesday, September 8, in connection with the Jubilee meeting of the American Chemical Society. The amount was not made public, but was said to be a substantial sum. "The award," the announcement stated, "is made possible by the generosity of the Proctor and Gamble Company of Cincinnati, and is made primarily to honour a scientist who has accomplished much as well as encouraged others who are working in the field of pure science without any thought of monetary reward. The reason for the particular interest of the Proctor and Gamble Co. is that their success in the hydrogenation of vegetable oils to produce hard fats of the Crisco type rests upon the foundation laid in pure science by the researches of Sabatier, who has never profited one penny from the applications of his fundamental data."

THE FARADAY SOCIETY has arranged a general discussion on "Physical Phenomena at Interfaces, with special reference to Molecular Orientation," to be held on October 1, at the Chemical Society's Rooms, Burlington House, Piccadilly, London, beginning at 2.30 p.m. The introductory address will be given by Dr. E. K. Rideal, and the following papers are to be read: "Electrification at Interfaces," by Professor H. Freundlich and R. K. Schofield; "Adsorption on Solids," by Dr. W. E. Garner; "Orientation in Solids," by Dr. G. Shearer; "Insoluble Films on Liquid Surfaces," by N. K. Adam and G. Jessop; "The Spreading of Proteins," by Professor Dr. E. Gorter; "Adsorption of Proteins," by Professor W. Ramsden; and "The Arrangement of Molecules on the Surface of Pure Liquids," by Dr. S. Sugden. Proofs of the papers will be available before the meeting, application for which should be made to the Faraday Society, 90, Great Russell Street, London, W.C.1.

Obituary

WILHELM SCHRANZ, director of the analytical laboratory of the I.G. Farbenindustrie A.G. at Elberfeld.

BRUNO LAMPEL, of the Bruno Lampel Farbenfabrik (dyestuff works), Cologne-Elberfeld, on August 30.

MR. FREDERICK E. ATTEAUX, president of F. E. Atteaux and Co., of Boston, first president of the Drysalterers' Club and a prominent figure for many years in the Boston dyestuffs industry.

References to Current Literature

British

ACIDS.—The optical resolution of chlorosulphoacetic acid. J. Read and A. M. McMath. *Chem. Soc. Trans.*, August, 1926, pp. 2192–2198.

The chemistry of the glutaconic acids. Part XX. Tetrahydroisophthalic acid. E. H. Farmer and H. L. Richardson. *Chem. Soc. Trans.*, August, 1926, pp. 2172–2178.

CADMIUM COMPOUNDS.—The bactericidal action of cadmium compounds. E. A. Cooper and L. I. Robinson. *J.S.C.I.*, September 10, 1926, pp. 321–323T.

CEMENT.—Modern Portland cement manufacture. S. Dickson. *J.S.C.I.*, September 10, 1926, pp. 310–312T.

The testing of Portland cement. R. H. H. Stanger. *J.S.C.I.*, September 10, 1926, pp. 312-315T.

COAL.—The constitution of coal. R. V. Wheeler. *J.S.C.I.*, September 10, 1926, pp. 307–310T.

GLASS.—The physical properties of glasses. The relationship to chemical composition and mode of preparation. W. E. S. Turner. *Chem. Soc. Trans.*, August, 1926, pp. 2091–2116.

HYDROGENATION.—The catalytic hydrogenation of carone. S. N. Iyer and J. L. Simonsen. *Chem. Soc. Trans.*, August, 1926, pp. 2049–2052.

NITRO COMPOUNDS.—2 : 3 : 4-Trinitrotoluene. F. H. Gornall and R. Robinson. *Chem. Soc. Trans.*, August, 1926, pp. 1981–1984.

OILS.—Organic theories of oil origin. E. Clark. *J. Inst. Petroleum Tech.*, June, 1926, pp. 257–278.

Working hypotheses in the geological search for oil. M. Stuart. *J. Inst. Petroleum Tech.*, June, 1926, pp. 316–335.

OPTICALLY ACTIVE COMPOUNDS.—A new method of diagnosing potential optical activity. Part II. J. Read and A. M. McMath. *Chem. Soc. Trans.*, August, 1926, pp. 2183–2191.

Optical activity and the polarity of substituent groups. Part IV. H. G. Rule and A. H. Numbers. *Chem. Soc. Trans.*, August, 1926, pp. 2116–2123.

OXIDES.—The catalytic dissociation of carbon monoxide. J. Cleminson and H. V. A. Briscoe. *Chem. Soc. Trans.*, August, 1926, pp. 2148–2154.

SALTPETRE.—The separation of potassium nitrate and the recovery of other salts from crude Indian saltpetre. M. A. Hamid. *J.S.C.I.*, September 10, 1926, pp. 315–320T.

WATERS.—The effect of chlorine on the absorption of dissolved oxygen by polluted waters. P. Gaunt and W. E. Abbott. *J.S.C.I.*, September 10, 1926, pp. 323–324T.

United States

ACIDS.—The natural occurrence of aconitic acid and its isomers. O. A. Beath. *J. Amer. Chem. Soc.*, August, 1926, pp. 2155–2158.

ARTIFICIAL SILK.—The advance of rayon. O. Wilson. *J. Ind. Eng. Chem.*, August, 1926, pp. 829–831.

CATALYSIS.—Catalysis and auto-oxidation. Anti-oxygenic and pro-oxygenic activity. C. Moureu and C. Dufraisse. *Chem. Reviews*, July, 1926, pp. 113–162.

ELECTRO-CHEMISTRY.—Electromotive force measurements in aqueous solutions of hydrochloric acid containing sucrose. H. Scatchard. *J. Amer. Chem. Soc.*, August, 1926, pp. 2026–2035.

The ionisation of weak electrolytes. D. A. MacInnes. *J. Amer. Chem. Soc.*, August, 1926, pp. 2068–2072.

FILTRATION.—Revivifying fuller's earth in a modern filter plant. *Chem. Met. Eng.*, August, 1926, pp. 472–473.

GENERAL.—Utilisation of diphenyl oxide in power generation. *Chem. Met. Eng.*, August, 1926, pp. 475–476.

Economy in the design of cylindrical tanks. S. Cottrell. *Chem. Met. Eng.*, August, 1926, pp. 482–483.

LEATHER.—The determination of moisture in leather. F. P. Veitch and T. D. Jarrell. *J. Amer. Leather Chem. Assoc.*, September, 1926, pp. 435–445.

Chrome tanning at the isoelectric point of collagen. R. M. Cobb and F. S. Hunt. *J. Amer. Leather Chem. Assoc.*, September, 1926, pp. 454–464.

ONIUM COMPOUNDS.—The basis for the physiological activity of certain -onium compounds. Part V. I. Bencowitz and R. R. Renshaw. *J. Amer. Chem. Soc.*, August, 1926, pp. 2146–2155.

PHENOLS.—The chemical properties of caproyl-resorcinol and some of its derivatives. D. Twiss. *J. Amer. Chem. Soc.*, August, 1926, pp. 2206–2212.

PHOTO-CHEMISTRY.—A review of photo-chemistry. W. A. Noyes, jun., and L. S. Kassel. *Chem. Reviews*, July, 1926, pp. 199–225.

PIPERIDINE.—Piperidine derivatives. Parts II. and III. S. M. McElvain. *J. Amer. Chem. Soc.*, August, 1926, pp. 2179–2185 and 2239–2242.

French

ABSORPTION.—The absorptive power of vegetable tissues. Part III. J. Effront. *Chim. et Ind.*, August, 1926, pp. 202–208.

ACIDS.—Investigation of the mechanism of the formation of sulphuric acid in the lead chamber process. Part II. A. Graire. *Chim. et Ind.*, August, 1926, pp. 181–189.

Dibenzylacetic acid and some derived amides. N. Maxim. *Bull. Soc. Chim.*, July, 1926, pp. 1024–1029.

ANALYSIS.—Estimation of calcium carbide in calcium cyanamide. G. Flusin and H. Giran. *Chim. et Ind.*, August, 1926, pp. 179–180.

NITRILES.—The preparation of nitriles by the diazo reaction. A. Korczynski and B. Fandrich. *Compt. rend.*, August 17, 1926, pp. 421–423.

OXIDATION.—The oxidation of manganese into manganic acid. Analytical applications. A. Travers. *Ann. Chim.*, July-August, 1926, pp. 56–86.

Autoxidation and anti-oxygen action. Catalytic action of various nitrogenous compounds. C. Moureu, C. Dufraisse and M. Badoche. *Compt. rend.*, August 17, 1926, pp. 408–412.

REACTIONS.—Study of reactions for the displacement of metals using a special method and apparatus. J. Barlot. *Ann. Chim.*, July-August, 1926, pp. 87–134.

Condensation of malonic esters with acetylacetic esters. Part II. H. Gault and L. Klees. *Bull. Soc. Chim.*, July, 1926, pp. 1000–1019.

SOIL.—Chemical methods for determining whether agricultural soils require a nitrogenous or potassic fertiliser. A. Nemec. *Compt. rend.*, August 30, 1926, pp. 483–485.

SULPHIDES.—Study of phosphorescent zinc sulphides. Parts III. and IV. A. A. Guntz. *Ann. Chim.*, July-August, 1926, pp. 5–55.

YEAST.—Review of the yeast industries. C. Schweizer. *Chim. et Ind.*, August, 1926, pp. 190–199.

German

ACIDS.—Alloxanic acid. H. Biltz and F. Lachmann. *J. prakt. Chem.*, August, 1926, pp. 309–332.

The synthesis of iridinic acid. F. Mauthner. *Annalen*, August 6, 1926, pp. 102–108.

ALDEHYDES.—2-Amino-3-methoxy-benzaldehyde. J. Tröger and S. Gerö. *J. prakt. Chem.*, August, 1926, pp. 293–308.

DRUGS.—Insulin—its properties and preparation in bulk. F. Laquer. *Z. angew. Chem.*, September 9, 1926, pp. 1051–1053.

HYDANTOINS.—The preparation of hydantoins. H. Biltz and K. Slotta. *J. prakt. Chem.*, August, 1926, pp. 233–267.

HYDRATES.—Salts of alloxanic acid ; a contribution to the systematic investigation of hydrates. H. Biltz and F. Lachmann. *J. prakt. Chem.*, August, 1926, pp. 333–347.

RUTHENIUM.—The chemistry of ruthenium. H. Remy. *Z. angew. Chem.*, September 9, 1926, pp. 1061–1065.

SILICON COMPOUNDS.—The thermal dissociation of some silico-fluorides. G. Hantke. *Z. angew. Chem.*, September 9, 1926, pp. 1065–1071.

WATER.—Experiences with the chlorine gas method for the treatment of water and sewage. G. Ornstein. *Z. angew. Chem.*, September 2, 1926, pp. 1035–1037.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

256,663-4. ACETIC ANHYDRIDE, MANUFACTURE OF. H. Dreyfus, 8, Waterloo Place, London, S.W.1. Application date, April 9, 1925.

256,663. It has been found that acetic anhydride can be obtained by subjecting acetic acid vapour to the action of heat if the anhydride is immediately separated from the water vapour by fractional condensation. The best results are obtained by effecting the process under reduced pressure. The fractionating column is maintained at a temperature higher than the boiling point of water, and lower than the boiling point of acetic anhydride under the existing pressure conditions. Contact materials may be present, such as sodium sulphate or calcium sulphate, or water-binding agents such as sodium bisulphate or sodium pyrosulphate. The reaction may be effected at 200°-700° C., the speed of the gases being greater at the higher temperatures to avoid decomposition. It is possible to obtain almost complete conversion of the acetic acid by this process.

256,664. It is known that when acetic acid vapour is passed over oxides or carbonates or barium, calcium, zinc., etc., or finely divided zinc, cadmium, aluminium, iron, or lead, acetone is formed if the acetic acid is dilute. It is now found that if glacial acetic acid or acetic acid of high concentration is used, then acetic anhydride is obtained provided the temperature is not too high, and the contact material is free of water. The best yield is obtained if the reaction vapour is subjected to fractional condensation, and the reaction is effected under reduced pressure. The catalyst may be any substance which has been hitherto used in the formation of acetone from acetic acid, and the temperature is about 300°-500° C. The acetic anhydride is immediately separated from the water vapour by fractional condensation.

256,711. SYNTHETIC RESIN. W. F. Fleet, 43, Winterbrook Road, Herne Hill, London, S.E.24, H. V. Potter, of the Damard Lacquer Works, Warwick Road, Greet, Birmingham, and Damard Lacquer Co., Ltd., 82, Victoria Street, London, S.W.1. Application date, May 15, 1925.

Resinous condensation products are obtained by the condensation of phenol and/or its homologues, and urea and/or its substitution products, with aldehydes such as formaldehyde. The proportion of phenol to urea may vary from 1:3 to 5:1. The preferred proportions are phenol 100 parts, urea 60 parts, 40 per cent. formaldehyde 250 parts. The product is resistant to mineral acids and insoluble in water, alkalis, and other solvents.

256,734. TITANIUM OXIDE, MANUFACTURE OF. P. A. Mackay, Adelaide House, King William Street, London, E.C.4. Application date, May 28, 1925.

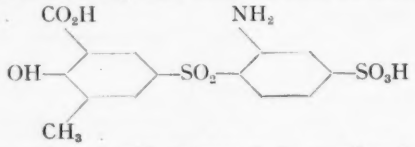
Finely powdered ilmenite is treated in a cast iron pan with oleum, which is gradually run into it, or, alternatively, the powdered ilmenite is gradually added to the oleum. If the powder is moist, sufficient heat is generated in contact with the oleum to start the reaction, which then proceeds exothermally. The mixture is continuously stirred to obtain a uniform action, and it is not necessary to apply any external heat. The resulting sulphates of titanium and iron are treated in the usual manner to obtain titanium oxide.

256,757. TREATING FIBROUS VEGETABLE MATERIAL FOR THE PRODUCTION OF CELLULOSE. Chemische Fabrik Griesheim-Elektron, 31, Gutleutstrasse, Frankfurt-on-Main, and H. Wenzl, 31, Savignystrasse, Frankfurt-on-Main, Germany. Application date, July 7, 1925.

Fibrous raw material such as wood, straw, etc., is subjected to preliminary treatment with a mixture of alkali sulphites and bisulphites, and then to a treatment with chlorine gas or aqueous solution, both treatments being effected in an acid medium. The preliminary treatment is effected in a closed boiler at a temperature of 145°-150° C., and pressure of 3-6 atmospheres for 10 hours. Some of the boiler lye of the preliminary treatment is left in or added to the fibrous material before the chlorination. The boiler lye may be used to dissolve the chlorinated incrusted material obtained in the second part of the process. The waste lye may be used to obtain tanning substances.

256,775. AMINO TRIARYL METHANES AND AZO DYESTUFFS DERIVED FROM THEM, MANUFACTURE OF. British Dyestuffs Corporation, Ltd., 70, Spring Gardens, Manchester, and K. H. Saunders, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, August 4, 1925.

Specification No. 245,865 (see THE CHEMICAL AGE, Vol. XIV, p. 184*a*) describes a new series of nitrosulphones obtained by treating an *o*-carboxyphenol-sulphinic acid with an aromatic nitro compound having a labile halogen atom. It has been found that amino sulphones obtained from the above such as

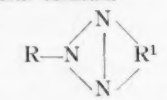


may be condensed with tetramethyl- or other tetra-alkyl-diaminobenzhydrols to obtain aminotriaryl-methanes. These may be diazotised and coupled, and any oxy-, amino-, or amino-oxy compound capable of coupling may be used as the second component. Yellow to red mono-azo-dyestuffs are obtained and several examples are given.

256,808-9. AZO DYESTUFFS, MANUFACTURE OF. A. G. Bloxam, London. From Chemische Fabrik Griesheim-Elektron, Frankfurt-on-Main, Germany. Application date, September 23, 1925.

256,808. Pigment dyestuffs are known which are obtained by combining unsulphonated diazo compounds with 2:3-oxynaphthoic acid arylides, and in this invention such unsulphonated diazo compounds are selected as are derived from mono-amino-bases of the diphenyl series. The mono-amino-diphenyl bases may be replaced by their homologues and substitution products, such as the 2- or 4-amino-diphenyl, amino-ditolyl, chloro-, and dichloro-amino-diphenyl, chloro- and dichloro-amino-ditolyl, etc. The dyestuffs are suitable for dyeing on the fibre, and a number of examples are given.

256,809. This process consists in the selection from among the unsulphonated diazo compounds referred to above of such bodies as are derived from amino substituted pseudo azimines of the general formula



in which R and R^1 are the same or different aryl residues which in addition to the amino group may be further substituted. The amino substituted aryl-pseudo-azimino-benzenes or aryl-pseudo-azimino-naphthalenes are particularly suitable. A large number of examples of these azo dyestuffs with the colours obtainable are given.

256,845. CONTINUOUS CARBONISATION AND CRACKING OF BITUMINOUS MATERIALS UNDER PRESSURE, PROCESS FOR. K. Bube, 16, Prinzenstrasse, Halle-Saale, Germany. Application date, December 22, 1925.

The object is to obtain the volatile bitumens entirely as liquid products in a continuous operation. The raw material is mixed with liquid hydrocarbon, and is pumped in the form of a pulp continuously through pressure-resisting vessels heated to 300° C. or more. The liquid, solid, and gaseous products are withdrawn continuously, the bituminous constituents being almost entirely in the form of liquid hydrocarbons. An example is given of the treatment of lignite rich in bituminous constituents, mixed with lignite producer gas tar.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—241,224 (M. and L. Meyer), relating to dissociating metal alloys, see Vol. XIV, p. 7 (Metallurgical Section) ; 242,990 (Farbwerke vorm. Meister, Lucius, and Brüning), relating to preparation of calcium nitrate, see Vol. XIV, p. 82 ; 244,450 (Farbwerke vorm. Meister, Lucius, and Brüning), relating to arylido-anthraquinone derivatives, see Vol. XIV, p. 185.

International Specifications not yet Accepted

254,708. DYES. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, July 3, 1925.

An unsulphonated *o*-oxydiazo compound is coupled with an unsulphonated 1-aryl-5-pyrazolone, at least one of the components containing a sulphamido group. The azo dyes may be converted into chromium compounds which give orange shades on wool. In an example, 2-aminophenol-4-sulphamide is nitrated, and the 6-nitro-2-aminophenol-4-sulphamide is diazotised and coupled with 1-phenyl-3-methyl-5-pyrazolone. Other examples are given, and also the production of the chromium compounds.

254,713. HYDROGENATING COAL AND OILS. I. G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, July 2, 1925.

In the hydrogenation of coal, tar, mineral oils, lignite, etc., the hydrogen used is obtained by partly decomposing hydrocarbons with oxygen to obtain hydrogen and carbon monoxide, the latter being subsequently removed or converted. The hydrocarbon used may be the gas obtained by the hydrogenation, after ethane, propane, etc., are removed. Carbon dioxide and water vapour, and catalysts such as nickel on magnesia, iron alloys, or molten iron, may be present during the decomposition.

254,726. SILICA GEL. Ring Ges. Chemischer Unternehmungen, Berlin. International Convention date, July 1, 1925.

Finely divided silica is produced by reacting on silicon fluoride with steam, and the adhering water is removed by suction. The silica is then moulded under pressure without removing its hygroscopic water, yielding a highly absorptive silica.

254,729. GLUCOSE. Corn Products Refining Co., 17, Battery Place, New York. (Assignees of W. B. Newkirk, 17, North Long Common Road, Riverside, Ill., U.S.A.) International Convention date, January 17, 1925.

Starch-converted glucose having a purity above 90 per cent. is completely melted and then crystallised at a temperature favourable to the production of anhydrous crystals. The mass is agitated to keep the solid phase in dispersion in the liquid, and then centrifuged. The sugar is of 95-96 per cent. purity, and is melted to a density of 40° Bé and crystallised at 120° F. to obtain anhydride crystals.

254,742-3. DYES. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany.) International Convention date, July 2, 1925.

254,742. Amino-Bz1-chlor- or amino-Bz1-brom-benzanthrone is treated with alcoholic caustic alkali to obtain products which give reddish-grey to black shades on cotton, becoming green on chlorinating.

254,743. This is an addition to 254,340 (see THE CHEMICAL AGE, Vol. XV, p. 256) which describes the halogenation of 6 : 6′ dihalogen-4 : 4′-dimethylthioindigos. The process is now extended to the halogenation of 6 : 6′ : 4 : 4′-tetrahalogen-, 6 : 6′ : 4 : 4′-tetramethylthioindigo-, and 4 : 4′-dihalogen-6 : 6′-dimethyl-thioindigos, the halogen entering the 5 : 5′-positions. Examples are given.

254,747. HYDROCYANIC ACID. Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler, 7, Weissfrauenstrasse, Frankfort-on-Main, Germany. International Convention date, July 3, 1925.

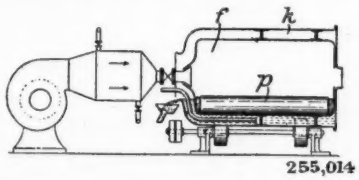
A small proportion of a substance capable of splitting off acid by hydrolysis is added to hydrocyanic acid to stabilise it. Suitable substances are halides of antimony, aluminium, lead, tin, arsenic ; easily hydrolysable salts such as those of zinc and iron ; easily saponifiable esters such as alkyl chlorides, sulphates, borates, oxalates ; halogen substituted esters such as bromacetic ester ; ethyl hydrogen sulphate, acetyl chloride, etc. Thus, liquid hydrocyanic acid with 2-6 per cent. of water can be stablised by adding 2 per cent. of ethyl sulphate.

254,753. PHENOLS. Chemische Fabrik auf Actien (vorm. E. Schering), 170, Mullerstrasse, Berlin. International Convention date, July 4, 1925.

Alkyl phenols and cyclohexanols are obtained by catalytic hydrogenation of the condensation products of a ketone with a phenol. To obtain alkyl phenols, a catalyst of nickel and bismuth is used, and to obtain cyclohexanols a catalyst of nickel and manganese is used, with a higher temperature, *e.g.*, 170° C. The hydrogenation of *p*-dioxydiphenyl-dimethylmethane yields a mixture of *p*-isopropyl-phenol and phenol, or a mixture of 4-isopropyl-cyclohexanol and cyclohexanol.

255,014. CONCENTRATING LATEX. K. D. P., Ltd., 7, Gracechurch Street, London. International Convention date, July 9, 1925.

A rotary drum *f* is provided with a heating jacket *k*, and is partly filled with latex so that a film is formed over the inner

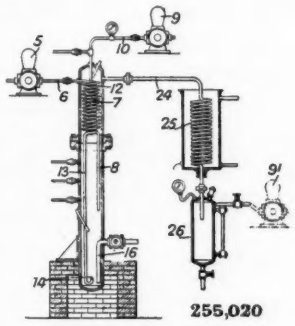


255,014

surface. Moisture is removed by a current of gas passed through the drum, and the thickness of the layer is controlled by a roller *p*, which may be heated. The thickened latex film is returned to the bulk by the action of the roller *p*.

255,020. OXIDISING OILS, ETC. W. B. D. Penniman, 341, St. Paul's Place, Courtland Street, Baltimore, U.S.A. International Convention date, July 7, 1925.

Crude petroleum, shale oils, waxes, sludges, cracked oils, tars, peat and lignite distillates, etc., are oxidised by means of



255,020

air, which may be enriched with oxygen, at or below atmospheric pressure, and at a temperature of 300°-1,000° F. Catalysts such as aluminium chloride, or oxides of manganese, lead, iron, chromium, vanadium, zinc, copper, or calcium may be used. The products include acetaldehyde, propionaldehyde, acetic, formic, propionic, butyric, acrylic and phthalic acids, alcohols, ketones, solvents, gums, etc.

A vertical gas-heated still is connected to a condensing coil 25 and receiver 26 of acid resisting metal. Oil is supplied by a pump 5, coil 12, and pipe 8, and air by a pump 9, pipe 10, coil 7, and pipe 13 terminating in a nozzle 14. The residue is withdrawn by a pipe 16. A detailed description is given of the treatment of a mid-continental gas oil containing 1 per cent. of sulphur.

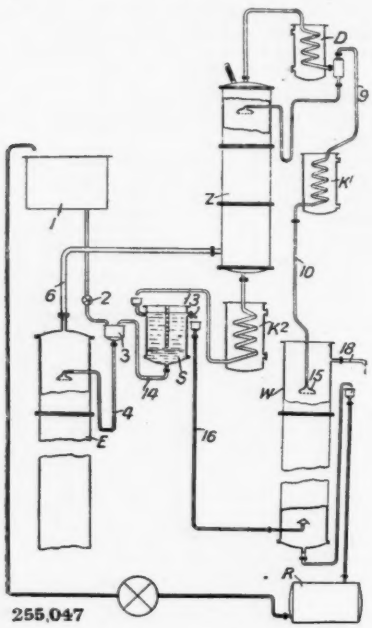
255,042. MAGNESIUM CHLORIDE. Compagnie de Produits Chimiques, Electrometallurgiques Alais, Froges, et Carmargue, 126, Rue la Boétie, Paris. International Convention date, July 8, 1925.

Dehydrated carnallite is treated with an anhydrous solvent for magnesium chloride, which does not dissolve the other ingredient, *e.g.*, methyl or ethyl alcohol. Magnesium and potassium chlorides are obtained. Similarly, dehydrated magnesium chloride yields magnesium chloride and magnesia.

255,043 and 255,047. ACETIC ACID. H. Suida, 33, Jubiläumsstrasse, Mödling, Lower Austria. International Convention date, July 13, 1925.

255,043. In the treatment of dilute aqueous or crude pyroligneous acid to obtain concentrated acetic acid, a superheated mixture of dilute acid and steam is treated with cresol and a low boiling solvent such as trichlorethylene, chloroform, carbon tetrachloride or ethylene chloride.

255,047. The dilute acid is superheated with steam in a column E and heated with a mixture of trichlorethylene 1

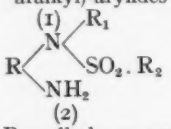


255,047

part, cresol 2 parts, from a tank 1. The vapour passes through a pipe 6 to a column Z and is sprayed with water from a dephlegmator D. Trichlorethylene and water pass off through a pipe 9 to a condenser K^1, and then through pipe 10 and sprayer 15 to a washer W. The condensate from Z passes through a cooler K^2 to a separator S, and water is drawn off at the top through pipe 16 to washer W. The trichlorethylene and cresol pass through a pipe 14 and funnel 3 back to the column E. Purified trichlorethylene is collected in a tank R.

255,072. DYES AND LAKES. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany). International Convention date, July 7, 1925.

Azo dyes are obtained by coupling diazotised *o*-amino-arylsulpho-alkyl (or aralkyl)-arylides having the formula



(2)

where R=arylene, R_1=alkyl or aralkyl, R_2=aryl, with arylides of 2 : 3-oxynaphthoic acid or acetoacetic arylides. A number of examples of these dyestuffs are given, as well as examples of the production of 1-arylsulpho-alkyl-or-aralkyl-amino-2-amino-aryls.

LATEST NOTIFICATIONS.

257,879. Method of and apparatus for adsorbing a gas or vapour from mixtures thereof. Silica Gel Corporation. September 4, 1925.

257,881. Alcohol, alcohol-containing mixtures, and similar liquids. Benzol-Verband Ges. September 4, 1925.

257,900. Manufacture of new compounds of gall acids. Soc. of Chemical Industry in Basle. September 2, 1925.

257,906. Removal of benzol from gases containing the same. I. G. Farbenindustrie Akt.-Ges. September 1, 1925.

257,907. Manufacture of hydroxy acid esters. Canadian Electro Products Co., Ltd. September 3, 1925.

257,910. Manufacture of valuable liquid products from coal, tars, and the like. I. G. Farbenindustrie Akt.-Ges. September 2, 1925.

257,912. Manufacture of valuable liquid products from carbonaceous materials. I. G. Farbenindustrie Akt.-Ges. September 2, 1925.

257,917. Manufacture of phosphorous or phosphoric acid and concurrently of activated charcoal. Soc. Pour L'Exploitation des Procedes E. Urbain. September 4, 1925.

257,925. Process for the production of artificial silk from viscose and similar cellulose solutions. Wolff and Co., Czapek, E., and Weingand, R. September 1, 1925.

Specifications Accepted with Date of Application

234,524. Treating ores. D. C. Hare. May 26, 1924.

240,789. Separating nickel and copper from copper-nickel mattes or other material. International Nickel Co. September 30, 1924.

238,523. Vat-dyestuffs of the anthracene series, Manufacture of. Farbwerke vorm. Meister, Lucius, and Brüning. August 13, 1924.

243,016. Concentrating caoutchouc latex or the like, Process and apparatus for. K. D. P., Ltd. November 14, 1924.

248,404. Synthetic camphor, Manufacture of. G. H. Dupont and G. Brus. March 2, 1925.

250,520. Purification of hydrogen. L'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude. April 9, 1925. Addition to 238,175.

252,690. Lithium carbonate, Process for the production of. Metallbank und Metallurgische Ges., Akt.-Ges. May 29, 1925.

257,353. Anthraquinone dyestuffs possessing affinity for acetyl silk, Manufacture of. British Dyestuffs Corporation, Ltd., W. H. Perkin and C. Hollins. June 4, 1925.

257,361. Arsenic compounds of the aromatic series, Manufacture of. A. J. Ransford. (L. Cassella and Co., Ges.) June 9, 1925.

257,372. Dry liquefied gases, Production of. J. Y. Johnson. (*Badische Anilin and Soda Fabrik.*) June 22, 1925.

257,418. Tetrazoles, Methods for the production of. K. F. Schmidt. September 21, 1925. Addition to 252,460.

257,434. Hydrogen, Manufacture of. J. H. Beaumont. (*Metal Research Corporation.*) October 14, 1925.

257,470. Chromates, Manufacture of. W. Carpmael. (*I. G. Farbenindustrie Akt.-Ges.*) December 17, 1925.

257,473. Alloys and method of preparing same. Beryllium Corporation of America. December 2, 1925.

257,479. Revoluble kilns for the distillation of bituminous substances. E. Roser. December 29, 1925.

257,528. Pigment colours, Manufacture and production of. J. Y. Johnson. (*I. G. Farbenindustrie Akt.-Ges.*) April 21, 1926.

Applications for Patents

Baddiley, J., Brightman, R., British Dyestuffs Corporation, Ltd., and Chorley, P. Dyeing with azo dyes. 22,058. September 7.

Baddiley, J., and British Dyestuffs Corporation, Ltd. Dyeing. 22,059. September 7.

Baddiley, J., Brightman, R., British Dyestuffs Corporation, Ltd., and Chorley, P. Dyes. 22,154. September 8.

Baddiley, J., Brightman, R., British Dyestuffs Corporation, Ltd., and Chorley, P. Application of azo dyes. 22,461. September 11.

British Dyestuffs Corporation, Ltd., and Wyler, M. Manufacture of quinoline derivatives. 21,947. September 6.

Coles, S. O. Cowper-. Sherardising. 22,403. September 11.

Coley, H. E. Manufacture of zinc. 21,895. September 6.

Coley, H. E. Treatment of ores, oxides, etc. 21,896. September 6.

Deutsche Gold-und-Silber Scheideanstalt vorm. Roessler and Zisch, W. Manufacture of caustic soda. 22,366. September 10.

Fairweather, H. G. C., and Industrial Waste Products Corporation. Recovery of solids from solutions. 21,946. September 6.

Fujii, M. Method of neutralising acidity, etc., of decomposed products. 22,476. September 11.

I. G. Farbenindustrie Akt.-Ges. and Imray, O. Y. Process for preparing quinoline derivatives. 22,467. September 11.

I. G. Farbenindustrie Akt.-Ges. Manufacture of liquid products from coal-tars, etc. 22,244. September 9. (Germany, September 10, 1925.)

I. G. Farbenindustrie Akt.-Ges. Purification of crude benzol. 22,245. September 9. (Germany, September 15, 1925.)

Scottish Dyes, Ltd., Thomas, J., and Wylam, B. Dyes, etc. 21,955. September 6. (March 1.)

Silesia Verein Chemischer Fabrieken. Processes for oxidising organic compounds. 22,381. September 10. (Germany, October 19, 1925.)

Soc. Chimique de la Grande-Paroisse, Azote et Produits Chimiques. Manufacture of formaldehyde. 22,052. September 7. (France, June 3.)

Soc. of Chemical Industry in Basle. Manufacture of dyestuffs. 22,146. September 8. (Switzerland, September 24, 1925.)

Synthetic Ammonia and Nitrates, Ltd. Production of gaseous fuels. 22,415. September 11.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £37 per ton, Powder, £39 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s. d/d; Contract, £8 10s. d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystal, £23 per ton. Powder, £24 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORATE (SOLID).—£5 12s. 6d. to £5 17s. 6d. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 64 O.P.—Industrial, 2s. 5d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 per ton for home market, 1-cwt. iron drums included.

SODIUM CHLORATE.—3d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4⅞d. to 5d. per lb. Crude 60's, 1s. 4d. to 1s. 5d.

ACID CRESYLIC 99/100.—2s. 6d. to 2s. 9d. per gall. 97/99.—2s. to 2s. 1d. per gall. Pale, 95%, 1s. 10d. to 2s. per gall. Dark, 1s. 9d. to 1s. 10d. per gall. Steady.

ANTHRACENE.—A quality, 2½d. to 3d. per unit.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.

BENZOL.—Crude 65's, 1s. 4d. to 1s. 5d. per gall., ex works in tank wagons. Standard Motor, 2s. to 2s. 3d. per gall., ex works in tank wagons. Pure, 2s. 3d. to 3s. 3d. per gall., ex works in tank wagons.

TOLUOL.—90%, 2s. to 3s. 3d. per gall. Pure, 2s. 3d. to 3s. 9d. per gall.

XYLOL.—2s. 3d. to 3s. 3d. per gall. Pure, 4s. per gall.

CREOSOTE.—Cresylic, 20/24%, 10d. per gall. Standard specification, middle oil, 6½d. to 7d. per gall. Heavy, 8d. to 8½d. per gall.

NAPHTHA.—Crude, 10d. to 1s. 1d. per gall. according to quality. Solvent 90/160, 2s. to 2s. 3d. per gall. Solvent 90/190, 1s. 5d. to 1s. 6d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £3 10s. to £4 10s. per ton. Whizzed or hot pressed, £5 10s. to £7 10s.

NAPHTHALENE.—Crystals and Flaked, £11 10s. to £13 per ton, according to districts.

PITCH.—Medium soft, 105s. to 120s. per ton, according to district.

PYRIDINE.—90/140, 16s. to 18s. per gall. Heavy, 7s. to 10s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. 6d. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—8s. per lb.

ACID H.—3s. 3d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—2s. 2d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100 % basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—9½d. per lb. naked at works.

ANILINE SALTS.—9½d. to 7½d. per lb. naked at works.

BENZALDEHYDE.—2s. 1d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100 % basis d/d.

o-CRESOL 29/31° C.—3d. to 3½d. per lb.

m-CRESOL 98/100%.—2s. 1d. to 2s. 3d. per lb.

p-CRESOL 32/34° C.—2s. 1d. to 2s. 3d. per lb.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—1s. 11d. to 2s. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLANILINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—11d. to 1s. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d.

B-NAPHTHYLAMINE.—3s. 2d. per lb. d/d.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. 3d. per lb. d/d.

p-NITRANILINE.—1s. 9d. per lb. d/d.

NITROBENZENE.—7d. per lb. naked at works.

NITRONAPHTHALENE.—10d. per lb. d/d.

R. SALT.—2s. 4d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 9d. per lb. 100% basis d/d.

o-TOLUIDINE.—9d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8. Grey, £17 10s. per ton. Liquor, 9d. per gall. 32° Tw.

CHARCOAL.—£7 to £9 per ton, according to grade and locality.

IRON LIQUOR.—1s. 6d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.

RED LIQUOR.—9½d. to 1s. per gall.

WOOD CREOSOTE.—2s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 6d. per gall. 60% O.P. Solvent, 3s. 6d. per gall, 40% O.P.

WOOD TAR.—£3 to £5 per ton, according to grade.

BROWN SUGAR OF LEAD.—£39 to £40 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 5d. per lb., according to quality, Crimson, 1s. 3d. to 1s. 7½d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—2s. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£46 to £55 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—5s. 3d. per lb.

ZINC SULPHIDE.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, 80% B.P.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 5d. per lb.

ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., according to quantity.

ACID, BORIC B.P.—Crystal, £44 per ton; Powder, £48 per ton. Carriage paid any station in Great Britain, in ton lots.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—1s. 6d. per lb.

ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.

ACID, SALICYLIC.—1s. 3½d. to 1s. 5d. per lb. Technical.—10½d. to 11d. per lb.

ACID, TANNIC B.P.—2s. 9d. to 2s. 11d. per lb.

ACID, TARTARIC.—1s. 0¼d. per lb., less 5%. Market firm.

AMIDOL.—9s. per lb., d/d.

ACETANILIDE.—1s. 7d. to 1s. 8d. per lb. for quantities.

AMIDOPYRIN.—11s. 6d. per lb.

AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity.

AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks.

ATROPINE SULPHATE.—11s. per oz. for English make.

BARBITONE.—9s. per lb.

BENZONAPHTHOL.—3s. 3d. per lb. spot.

BISMUTH CARBONATE.—12s. 3d. to 14s. 3d. per lb.

BISMUTH CITRATE.—9s. 6d. to 11s. 3d. per lb.

BISMUTH SALICYLATE.—10s. to 12s. per lb.

BISMUTH SUBNITRATE.—10s. 6d. to 12s. 6d. per lb., according to quantity.

BORAX B.P.—Crystal, £27; Powder, £28 per ton. Carriage paid any station in Great Britain, in ton lots.

BROMIDES.—Potassium, 1s. 8d. to 1s. 11d. per lb.; sodium, 1s. 10d. to 2s. 2d. per lb.; ammonium, 2s. 1d. to 2s. 5d. per lb., all spot.

CALCIUM LACTATE.—1s. 5d.

CHLORAL HYDRATE.—3s. 3d. to 3s. 6d. per lb., duty paid.

CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.

CREOSOTE CARBONATE.—6s. per lb.

FORMALDEHYDE.—£39 per ton, in barrels ex wharf.

GUAIACOL CARBONATE.—7s. to 7s. 6d. per lb.

HEXAMINE.—2s. 4d. to 2s. 6d. per lb.

HOMATROPINE HYDROBROMIDE.—30s. per oz.

HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 8d. per gallon f.o.r. makers' works, naked.

HYDROQUINONE.—4s. 3d. per lb., in cwt. lots.

HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.

IRON AMMONIUM CITRATE B.P.—2s. to 2s. 3d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 1d. to 2s. 4d. per lb.

IRON PERCHLORIDE.—22s. per cwt., 112 lb. lots.

MAGNESIUM CARBONATE.—Light Commercial, £31 per ton net.

MAGNESIUM OXIDE.—Light Commercial, £67 10s. per ton, less 2½%, price reduced; Heavy Commercial, £22 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.

MENTHOL.—A.B.R. recrystallised B.P., 19s. 9d. net per lb., Synthetic, 12s. to 14s. per lb., according to quantity.

MERCURIALS.—Red oxide, 5s. 11d. to 6s. 1d. per lb.; Corrosive sublimate, 4s. 3d. to 4s. 5d. per lb.; white precipitate, 4s. 9d. to 4s. 11d. per lb.; Calomel, 4s. 6d. to 4s. 8d. per lb.

METHYL SALICYLATE.—1s. 4d. to 1s. 7d. per lb.

METHYL SULPHONAL.—16s. 6d. per lb.

METOL.—11s. per lb. British make.

PARAFORMALDEHYDE.—1s. 9d. for 100% powder.

PARALDEHYDE.—1s. 2d. to 1s. 4d. per lb.

PHENACETIN.—3s. 9d. to 4s. per lb.

PHENAZONE.—5s. 9d. to 6s. per lb.

PHENOLPHTHALEIN.—4s. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—81s. per cwt., less 2½% for ton lots.

POTASSIUM CITRATE.—1s. 11d. to 2s. 2d. per lb.

POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots. Quiet.

POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.

POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.

POTASSIUM PERMANGANATE.—B.P. crystals, 6½d. per lb., spot.

QUININE SULPHATE.—1s. 8d. to 2s. per oz., in 100 oz. tins.

RESORCIN.—4s. 3d. to 4s. 9d. per lb., spot.

SACCHARIN.—55s. per lb.

SALOL.—3s. per lb.

SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.

SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb., B.P.C. 1923. 1s. 11d. to 2s. 2d. per lb., according to quantity.

SODIUM FERROCYANIDE.—4d. per lb. carriage paid.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. to 85s. per cwt., according to quantity.

SODIUM SALICYLATE.—Powder, 1s. 9d. to 1s. 10d. per lb. Crystal, 1s. 10d. to 1s. 11d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.

SODIUM SULPHITE, ANHYDROUS, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.

SULPHONAL.—10s. 6d. per lb.

TARTAR EMETIC, B.P.—Crystal or Powder, 1s. 11d. to 2s. per lb.

THYMOL.—11s. 6d. to 13s. 9d. per lb., according to quantity.

Perfumery Chemicals

ACETOPHENONE.—10s. per lb.

AUBEPINE (EX ANETHOL).—10s. 9d. per lb.

AMYL ACETATE.—2s. per lb.

AMYL BUTYRATE.—5s. 6d. per lb.

AMYL SALICYLATE.—3s. 3d. per lb.

ANETHOL (M.P. 21/22° C.).—6s. per lb.

BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. 1d. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—2s. 1d. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 7d. per lb.

BENZYL BENZOATE.—2s. 4d. per lb.

CINNAMIC ALDEHYDE NATURAL.—17s. 9d. per lb.

COUMARIN.—11s. 6d. per lb.

CITRONELLOL.—15s. per lb.

CITRAL.—9s. 6d. per lb.

ETHYL CINNAMATE.—10s. per lb.

ETHYL PHTHALATE.—3s. per lb.

EUGENOL.—10s. per lb.

GERANIOL (PALMAROSA).—19s. per lb.

GERANIOL.—6s. 3d. to 10s. 6d. per lb.

HELIOTROPINE.—5s. per lb.

ISO EUGENOL.—14s. 6d. per lb.

LINALOL.—12s. to 17s. per lb.

LINALYL ACETATE.—15s. to 18s. 6d. per lb.

METHYL ANTHRANILATE.—9s. 3d. per lb.

METHYL BENZOATE.—5s. per lb.

MUSK KETONE.—34s. per lb.

MUSK XYLOL.—8s. 3d. per lb.

NEROLIN.—3s. 9d. per lb.

PHENYL ETHYL ACETATE.—12s. per lb.

PHENYL ETHYL ALCOHOL.—9s. 9d. per lb.

RHODINOL.—28s. 6d. per lb.

SAFROL.—1s. 6d. per lb.

TERPINEOL.—1s. 6d. per lb.

VANILLIN.—20s. 6d. per lb.

Essential Oils

ALMOND OIL.—11s. 6d. per lb.

ANISE OIL.—3s. 6d. per lb.

BERGAMOT OIL.—29s. per lb,

BOURBON GERANIUM OIL.—13s. 3d. per lb.

CAMPHOR OIL.—67s. 6d. per cwt.

CANANGA OIL, JAVA.—20s. per lb.

CINNAMON OIL, LEAF.—6d. per oz.

CASSIA OIL, 80/85%.—9s. 3d. per lb.

CITRONELLA OIL.—Java, 85/90%, 2s. 7d. Ceylon, 2s. 2d. per lb.

CLOVE OIL.—6s. 3d. per lb.

EUCALYPTUS OIL, 70/75%.—2s. per lb.

LAVENDER OIL.—French 38/40%, Esters, 18s. 6d. per lb.

LEMON OIL.—10s. 6d. per lb.

LEMONGRASS OIL.—4s. 6d. per lb.

ORANGE OIL, SWEET.—10s. 3d. per lb.

OTTO OF ROSE OIL.—Bulgarian, 70s. per oz. Anatolian, 30s. per oz.

PALMA ROSA OIL.—9s. 9d. per lb.

PEPPERMINT OIL.—Wayne County, 45s. per lb. Japanese, 11s. 9d. per lb.

PETITGRAIN OIL.—9s. per lb.

SANDAL WOOD OIL.—Mysore, 26s. per lb. Australian, 17s. 3d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, September 16, 1926.

BUSINESS has been quietly steady during the past week, and there is really no special feature. Having regard to the lengthy coal dispute, demand is surprisingly well maintained. Export inquiry is fair.

General Chemicals

ACETONE.—Price is nominal and buyers should negotiate specially for their requirements.

ACETIC ACID continues in good demand; technical 80% is £37 per ton, and pure 80%, £38 per ton.

ACID FORMIC is in fair demand, price unchanged.

ACID LACTIC is very quiet. Price £43 per ton for 50% by weight.

ACID OXALIC has been in slightly better demand, and with the absorption of second hand parcels, price is firmer at 3¾d. per lb.

ACID TARTARIC is in comparatively small demand, but price is very firm at 11¾d. per lb.

ALUMINA SULPHATE shows a firmer tendency, 17–18% being quoted at £5 10s. to £5 15s. per ton.

AMMONIUM CHLORIDE is in small demand, price about £19 per ton.

ARSENIC remains an uncertain market.

BARIUM CHLORIDE is in better inquiry, price is rather firmer at £10 per ton. Makers are well sold for the remainder of the year, and are not yet prepared to sell for next year.

COPPER SULPHATE.—Unchanged.

EPSOM SALTS are firmer at £5 10s. per ton.

FORMALDEHYDE.—The demand is of small proportions, and price is firm at £41 per ton.

LEAD ACETATE is rather easier on second hand offerings; white, £45 per ton, and brown unchanged at £43 per ton.

METHYL ACETONE is firm and higher prices are expected. Price about £55 to £56 per ton.

METHYL ALCOHOL is firm at £48 per ton. An advance in price is not unlikely.

POTASSIUM CHLORATE is quiet. Price steady at 3½d. per lb.

POTASSIUM PERMANGANATE is in moderate demand at 7½d. per lb. for higher grades.

POTASSIUM PRUSSIATE.—The demand is small, but prices are firm at 7d. per lb.

SODA ACETATE is scarce for early delivery and is quoted at £20 10s. to £21 per ton.

SODA BICHROMATE is an active market. British makers' prices remain unchanged at 3½d. per lb. Foreign make slightly cheaper.

SODA NITRITE.—A fair business is passing at about £20 10s. per ton.

SODA PHOSPHATE.—Unchanged at £14 per ton.

SODA PRUSSIATE is very slow, and is quoted at 3¾d. per lb.

SODA HYPOSULPHITE.—Unchanged.

SODA SULPHIDE.—Unchanged.

ZINC SULPHATE.—Unchanged.

Latest Oil Prices

LONDON.—LINSEED OIL steady at 2s. 6d. to 5s. advance. Spot, £31 10s., ex-mill; September, £30 7s. 6d.; October-December, £31 5s.; January-April, £32. RAPE OIL quiet. Crude extracted, spot, £46 10s.; technical refined, £48 10s.; ex-wharf. COTTON OIL slow. Refined common edible, £42; Egyptian crude, £35; deodorised, £44. TURPENTINE steady, but quiet. American, spot, 68s. 6d.; October-December, 64s. 6d.; January-April, 66s. 6d.; and May-June, 65s. 3d. per cwt.

HULL.—LINSEED OIL.—Spot to October-December, £31 15s.; January-April, £32; COTTON OIL.—Bombay crude, £33; Egyptian crude, £33 15s.; edible refined, £38 10s.; technical, £37. PALM KERNEL OIL.—Crushed, naked, 5½ per cent., £41 10s. GROUNDNUT OIL.—Crushed/extracted, £43 10s.; deodorised, £47 10s. RAPE OIL.—Crude/extracted, £46; refined, £48 per ton, net cash terms, ex mill. CASTOR OIL and COD OIL unchanged.

Nitrogen Products

EXPORT.—During the last week the sulphate of ammonia position has been quiet, supplies have been small, and slightly higher prices have been secured. The present price f.o.b. U.K. port in single bags ranges from £10 17s. 6d. to £11 per ton.

HOME.—Considerable bookings for delivery during the winter and spring months have been reported from various parts of the country. There is no doubt that many buyers are anxious about supplies. The producers are busy now delivering to fertiliser manufacturers, who have bought large quantities for delivery up to Christmas. Irish merchants report considerable inquiry for autumn delivery, and it is understood that this demand is being met by British producers.

NITRATE OF SODA.—Reports from America indicate that the end of the uncertainty regarding nitrate prices has stimulated buying. Purchases by America as well as by Europe are at present substantially below the figures at the same time last year. Shipments of small quantities continue to be made at list prices.

THE MAGNESIAN FLOORING MATERIALS ASSOCIATION, formerly the Magnesian Composition Building Materials Association, has been formed for the purpose of developing and increasing the use of magnesian compositions for all purposes, such as jointless flooring, ships' decks, stucco work, plaster work, etc., periodically bringing to the notice of architects, builders and others, by the circulation of technical and informative literature, the distinguishing features of magnesian compositions. The association is co-operating with recognised research organisations for the purpose of improving and standardising magnesian compositions, and promoting exchange of views between manufacturers for the purpose of determining the best method of manufacturing, extending and conducting the magnesian compositions business. Persons or firms having interest in such material are invited to correspond with the secretary at the offices of the association, 106, Fenchurch Street, London, E.C.3.

British Glues and Chemicals

THE sixth ordinary general meeting of British Glues and Chemicals, Ltd., was held on Wednesday, in London, Mr. T. Walton, the chairman, presiding. The financial details in the directors' report were given in last week's issue of THE CHEMICAL AGE.

Mr. Walton said that they had concluded arrangements for raw material which were economically sounder and showed a considerable reduction in price on those lately in force. They trusted those arrangements would be respected and maintained by all concerned, for, in any event, it was necessary for them to uphold their goodwill, even at considerable cost. He felt that the board had no option but to take the course it did, after the deepest consideration and recognition of what it meant, and he hoped and anticipated that they would have a period of more reasonable price in the present year. To set against the almost continual hardening in the price of raw material, they had achieved lower working costs than in any previous year. Unfortunately, however, a further increase in railway charges was foreshadowed for January 1 next, and this year's accounts would have to bear a very heavy charge in respect of coal. There had been no relaxing of the efforts of their research department in the direction of improvement of their products, raising their extract percentages, and in the search for further uses for goods, and satisfactory progress had been made in the development of their cattle-feeding specialities. It was hoped that the conversations now proceeding with Continental manufacturers would lead to avoidance of foolish expenditure of carriage and freight between the various countries without in any way interfering with the right of all to sell where they would. Difficult as they have found trading conditions, some of their fellow-manufacturers had met with even worse fortune, and they had acquired the assets and connections of three competitors, in two cases from receivers appointed by debenture holders. They had for many years had important interests in Ireland, and had acquired a holding in an Irish company to safeguard those interests. At the moment, negotiations were approaching completion for the purchase of practically the whole of the shares of B. Young and Co., Ltd., of Bermondsey—a leading firm of hide glue manufacturers. Whilst they were naturally chary under present circumstances of increasing their responsibilities, the offer was made on terms they felt it wise to accept, and the acquisition of this important London business would improve their geographical position and strengthen their hold on a section of the trade which previously was not very well represented in their organisation.

THE BRITISH INDUSTRIES FAIR for next year promises so well that the Birmingham Chamber of Commerce, which is responsible for the organisation and control of the Birmingham and Midland Section of the fair, is enlarging the Exhibition buildings at Castle Bromwich. Workmen commenced operations last week. It is proposed to widen each of the three huge exhibition halls. At the present time the halls have a total letting space of 85,000 ft. When the extension is made this space will be increased to 125,000 ft. There is reason to believe that the additional 40,000 ft. will be fully taken up, as 90,000 ft. of space has already been let to 400 exhibitors.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, September 15, 1926.

THE heavy chemical market remains unchanged and, although inquiry for export is moderately good, buying for home consumption is negligible. Prices still continue on about the same level as last reported.

Industrial Chemicals

ACID ACETIC, 98/100%.—£55 to £67 per ton, according to quality and packing, c.i.f. U.K. port; 80% pure, £39 to £41 per ton; 80% technical, £38 to £39 per ton, c.i.f. U.K. ports.

ACID BORIC.—Crystal, granulated or small flakes, £37 per ton; powdered, £39 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Now quoted 5d. per lb., delivered or f.o.b. U.K. ports. Good inquiry and prices inclined to be firmer.

ACID CITRIC, B.P. CRYSTALS.—Quoted 1s. 3¼d. per lb., less 5% ex store. Offered for prompt shipment at 1s. 3d. per lb., less 5% ex wharf.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC, 80%.—Usual steady demand and price unchanged at £23 5s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—Quoted 3¾d. per lb., ex wharf, duty paid. Spot material on offer in limited quantities at 3⅞d. per lb., ex store.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—In light demand and price nominally 11¾d. per lb., less 5% ex store, but this price could probably be shaded.

ALUMINA SULPHATE, 17/18%, IRON FREE.—On offer from the Continent at about £5 8s. 6d. per ton, c.i.f. U.K. ports. Spot material quoted £6 5s. per ton, ex store.

ALUM, LUMP POTASH.—On offer from the Continent at £7 15s. per ton, c.i.f. U.K. ports. Spot material quoted £9 per ton, ex store. Crystal powder, £8 5s. per ton, ex store, or £7 12s. 6d. per ton, c.i.f. U.K. ports.

AMMONIA ANHYDROUS.—Imported material selling at about 11¼d. to 11½d. per lb., ex wharf, containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £23 10s. to £25 10s. per ton, ex station. Continental on offer at about £21 10s. per ton, c.i.f. U.K. ports. Fine white crystals of continental manufacture quoted £18s. 5s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Now quoted £16 5s. per ton, ex store, or £15 10s. per ton, ex wharf, prompt despatch from mines.

BARIUM CARBONATE, 98/100%.—White powdered quality quoted £6 15s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—On offer from the Continent at about £8 15s. per ton, c.i.f. U.K. ports. Spot material quoted £9 15s. per ton, ex store.

BLEACHING POWDER.—English material unchanged at £9 10s. per ton, ex station. Contracts 20s. per ton less. Continental now quoted £7 15s. per ton, c.i.f. U.K. ports.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £22 10s. per ton; crystals, £23 per ton; powdered, £24 per ton, carriage paid U.K. stations.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, ex station. Continental rather easier at £3 15s. per ton, c.i.f. U.K. port.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or at £4 2s. 6d. per ton, f.o.b. U.K. port, for export.

COPPER SULPHATE.—Continental material on offer at about £22 per ton, ex wharf. Moderate inquiry for export and price of English material about £23 5s. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Spot material quoted £40 per ton, ex store. Quoted £39 per ton, c.i.f. U.K. ports, early shipment.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 17s. 6d. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material on offer at £38 5s. per ton, ex store.

LEAD, WHITE.—Now quoted £38 10s. per ton, ex store.

LEAD, ACETATE.—White crystals quoted £44 10s. per ton, c.i.f. U.K. ports. Prompt shipment. Brown about £40 5s. per ton, c.i.f. U.K. ports.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

POTASH, CAUSTIC, 88/92%.—Syndicate prices vary from £25 10s. to £28 15s. per ton, c.i.f. U.K. ports according to quantity and destination. Spot material available at about £29 per ton.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

POTASSIUM CARBONATE, 96/98%.—Quoted £25 5s. per ton, ex wharf, early delivery. Spot material on offer at £26 10s. per ton, ex store. 90/94% quality quoted £22 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 98/100%.—Powdered quality on offer from the Continent at about £25 10s. per ton, c.i.f. U.K. ports. Crystals, £2 per ton extra.

POTASSIUM NITRATE (SALTPETRE).—Spot material quoted £24 per ton, ex store. On offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 7½d. per lb., ex store, spot delivery. To come forward 7d. per lb., ex wharf.

POTASSIUM PRUSSIATE, YELLOW.—Unchanged at about 6¾d. per lb., ex store, spot delivery. On offer from the Continent at about 6½d. per lb., c.i.f. U.K. ports.

SODA CAUSTIC.—76/77%, £17 10s. per ton; 70/72%, £16 2s. 6d. per ton; broken, 60%, £16 12s. 6d. per ton; powdered, 98/99%, £20 17s. 6d. per ton. All carriage paid U.K. stations, spot delivery. Contracts 20s. per ton less.

SODIUM ACETATE.—English material quoted £22 per ton, ex station. Continental on offer at about £20 10s. per ton, ex store, or to come forward £19 15s. per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—English price unchanged at 3½d. per lb., delivered.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, £1 7s. 6d. per ton more; alkali 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture, £9 per ton, ex station. Minimum 4-ton lots. Pea crystals, £14 10s. per ton, ex station. Commercial of continental manufacture on offer at about £7 10s. per ton, c.i.f. U.K. ports.

SODIUM NITRATE.—Quoted £13 per ton, ex store; 96/98%, refined quality, 7s. 6d. per ton extra.

SODIUM NITRITE, 100%.—Quoted £24 per ton, ex store. Offered from the Continent at about £22 5s. per ton, c.i.f. U.K. ports.

SODIUM PRUSSIATE, YELLOW.—In good demand for export. Price now 3¾d. per lb., c.i.f. U.K. ports. Spot material about 3¾d. per lb., ex store.

SODIUM SULPHATE, SALTCAKE.—Price for home consumption, £3 10s. per ton, ex works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE, 60/62%.—Solid, £13 5s. per ton; broken, £14 5s. per ton; flake, £15 5s. per ton; crystals, 31/34%, £8 12s. 6d. per ton. All delivered buyers' works U.K.; minimum 5 ton lots, with slight reduction for contracts. 60/62%, solid quantity offered from the Continent at about £8 15s. per ton, c.i.f. U.K. ports; broken quality, 15s. per ton more; crystals, 30/32%, about £6 10s. per ton, c.i.f. U.K. ports.

SULPHUR.—Flowers, £11 10s. per ton; roll, £10 5s. per ton; rock, £10 5s. per ton; floristella, £9 15s. per ton; ground American, £9 per ton; ex store, spot delivery. Prices nominal.

ZINC CHLORIDE.—British material, 98/100%, quoted £24 15s. per ton, f.o.b. U.K. ports; 98/100%, solid, on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports; powdered, 20s. per ton extra.

ZINC SULPHATE.—Continental make on offer at about £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates

SODIUM NAPHTHIONATE.—1s. 8d.-1s. 9d. per lb.; some home inquiries.

PARANITRANILINE.—1s. 9d. per lb.; small home inquiries.

SULPHANILIC ACID.—9d. per lb.; some home inquiries.

ORTHO TOLUIDINE.—9d. per lb.; some home inquiries.

ALPHA NAPHTHYLAMINE.—1s. 3d. per lb.; small home inquiries.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, September 16, 1926.

The restricted demand for chemical products on the Manchester market is reflected to some extent this week, and in a few instances by slightly easier prices, although the market as a whole continues steady. The home demand remains quiet generally, the coal stoppage exercising a depressing influence on many of the chemical-using industries. Shipments are also on a comparatively small scale, as they have been for some time now. The Continental demand is slow, most of the business reported being with the Dominions.

Heavy Chemicals

Sulphide of soda continues to move in limited quantities and quotations remain easy, although perhaps not actually changed; for 60-65 per cent. concentrated solid about £10 10s. per ton is still being asked, with commercial crystals offering at £8 5s. Phosphate of soda is also a slow seller at about £12 10s. per ton. Bicarbonate of soda is in fair demand and values are unchanged at £10 10s. per ton. Bichromate of soda keeps fairly steady at 3¼d. per lb., and a moderate inquiry has been reported during the week. Alkali, 58 per cent. material, meets with the usual inquiry at £6 15s. to £7 per ton. Chlorate of soda is quiet and prices are barely steady at about 3¼d. per lb. Prussiate of soda is in fair demand and quotations are maintained at round 3¾d. per lb. Sales of caustic soda remain steady and values are firm at from £17 10s. per ton for 76 per cent. strength down to £15 2s. 6d. for 60 per cent. The demand for nitrite of soda is restricted and prices have an easy tendency, with current values at about £19 10s. per ton. Saltcake continues dull at round £3 5s. per ton. Glauber salts, also, are attracting only limited attention, although prices are unchanged at £3 15s. Bleaching powder is selling in moderate quantities at round £8 10s. per ton. The demand for hyposulphite of soda is still on a limited scale, but values keep fairly steady at about £9 10s. per ton for commercial quality and £15 to £15 10s. per ton for photographic.

Some inquiry for yellow prussiate of potash has been reported at steady rates, about 6¾d. per lb. still being an average quotation. Bichromate of potash meets with a quiet demand and values are maintained at 4¼d. per lb. Permanganate of potash is rather quiet and prices have an easy tendency, with B.P. material on offer at about 6¾d. per lb. and commercial at 5d. Chlorate of potash has been on the slow side this week, although quotations remain at round 3⅝d. per lb. Caustic potash keeps steady and meets with a moderate amount of inquiry at £27 per ton. Carbonate of potash is now being offered at round £26 10s. per ton, and the demand is fair.

Nitrate of lead is in fair request at steady prices, from £40 to £41 per ton being currently quoted. Lead acetate is also well held at £46 10s. per ton for white and about £42 for brown. There is not much call for acetate of lime, although values are about maintained at round £17 10s. per ton for grey material and £8 for brown. Arsenic is steady at £13 5s. to £13 10s. per ton for white powdered, Cornish makes, but the demand for this is still slow. For sulphate of copper export inquiry remains at about its recent moderate level, with prices about unchanged at £22 15s. per ton, f.o.b.

Acids and Tar Products

A quiet demand for acetic acid has been reported and values show little change on the week, 80 per cent. commercial material being offered at £37 to £38 per ton and glacial at round £66. Citric acid is quoted at 1s. 3¼d. to 1s. 3½d. per lb., with only a moderate inquiry for this reported. Buying interest in tartaric acid is also limited just now; prices, however, show little change at 11¾d. per lb. Oxalic acid remains steadier at 3½d. to 3⅝d. per lb., but the demand for this is slow.

Pitch keeps very firm, although more or less nominal, with £5 10s. per ton mentioned this week as the probable f.o.b. value at the present time. Solvent naphtha is fully maintained at round 1s. 11d. per gallon, with creosote oil in much the same position at 7¾d. per gallon. Carbolic acid crystals are now quoted at 5¼d. to 5½d. per lb.

Manchester University Technology Courses

The prospectus of university courses in the Municipal College of Technology, Manchester, for session 1926–27, has just come to hand. The department of applied chemistry is under the direction of Professor F. L. Pyman, F.R.S., who is assisted by a large staff of lecturers and demonstrators on such diverse subjects as organic and physical chemistry, metallurgy and assaying, fuels, fermentation, applied chemistry and chemical technology, tinctorial chemistry and dyestuffs, foodstuffs, etc. The work of the college includes advanced study in various branches of science and technology, and university courses in the Faculty of Technology, extending over three years and leading to degrees and certificates in applied chemistry, including general chemical technology; the chemistry of textiles (bleaching, dyeing, printing and finishing); paper manufacture; metallurgy and assaying; chemical technology of brewing; electro-chemistry; photography; colouring matters (higher course); foodstuffs (higher course); and fuels (higher course). The breadth of the course on general chemical technology may be judged from the fact that it deals with subjects as various as chemical engineering, political economy, construction of works, colloids, etc. Students may qualify for the degrees of Bachelor of Technical Science (B.Sc.Tech.), Master of Technical Science (M.Sc.Tech.), and Doctor of Philosophy (Ph.D.); for the certificate of the University; and for the title of Associate of the College of Technology. The principal of the College of Technology is Mr. B. Mouat Jones.

Water-Resistant Animal Glue

A method of preparing a water resistant animal glue was given recently by F. L. Browne and C. E. Hrubesky in a paper read before the Division of Gelatin and Leather Chemistry of the American Chemical Society. The authors pointed out that although animal glue could be rendered insoluble by treatment with formaldehyde, it had been difficult to make use of this reaction for preparing a practicable water-resistant glue for woodworking because the reaction took place so rapidly that the mixture "gelled" before it could be applied to the surfaces to be joined. However, by using instead of formaldehyde one of its polymers or compounds which depolymerised or hydrolysed slowly, it was possible to introduce a sufficient quantity of available formaldehyde to render the glue water-resistant and still keep it fluid long enough to apply it by means of the customary machinery of the glue room. The working life of the glue could be further extended by the addition of small amounts of certain acids. A glue giving a degree of water resistance comparable with the best casein glues was prepared as follows: A grade of animal glue suitable for woodworking was soaked in such a proportion of cold water as was required by its grade and was then "melted" in the glue pot. Paraformaldehyde of 50 mesh fineness and oxalic acid were then added in the proportions respectively of 10 per cent. and 5 per cent. of the weight of dry glue taken. As soon as the oxalic acid had dissolved the glue was ready for use and would remain in a suitable condition for application for 7 to 9 hours at a temperature not exceeding 45° C.

A Memorial to "Old Boys"

The Governors of Ellesmere College, Shropshire, have decided to proceed with the building of the memorial chapel at this well-known public school. The chapel is intended as a memorial to all old Ellesmerians and especially those who fell in the war of 1914 to 1918, and it has been designed on broad lines by Sir Aston Webb, to accord with the present school buildings. The ceremony of laying the foundation stone by Sir Offley Wakeman, the Custos of the College, has been arranged for September 30 (with a preliminary Festival Service for St. Oswald, the Patron Saint of the College, on the previous evening), and a number of Church dignitaries, including the Bishop of Lichfield, will be present and officiate at the actual laying of the stone. The Governors appeal to all old Ellesmerians to be present at the ceremony, not only as a tribute to their old school, but to say "Vale" to the Rev. T. H. Heaworth, the present headmaster, who is retiring after a lengthy and useful service to the cause of education. Full details will be gladly supplied by the Secretary, Ellesmere College, Shropshire, and contributions to the Building Fund acknowledged.

Company News

IDRIS HYDRAULIC TIN, LTD.—An interim dividend at the rate of 1s. per share (less income tax) is announced, payable on September 24.

BRITISH ALUMINIUM CO.—The directors have resolved that an interim dividend of 4 per cent. (actual), less tax, be paid, on the ordinary shares on October 1.

DOMINION TAR AND CHEMICAL CO., LTD.—An interim dividend for the year 1926 of 5½ per cent. (subject to tax at 2s. 2½d.) has been declared on the ordinary share capital, payable on or before September 28.

ROOIBERG MINERALS DEVELOPMENT CO.—For the year ended June 30 last the profit amounts to £18,428, which, together with £19,732 brought forward, makes a total of £38,160. After payment of the two dividends of 2½ per cent. each, a balance of £19,962 remains to be carried forward.

AMERICAN CELLULOSE AND CHEMICAL MANUFACTURING CO., LTD.—The board has declared a dividend of 1¾ per cent. on the 7 per cent. cumulative first participating preference stock of the company issued prior to June 30, 1926, payable on September 30. With the initial dividend paid on June 30 last the total dividend to date is 5¼ per cent.

Tariff Changes

FRANCE.—A Decree prohibiting the export from France of chloride of potassium, sulphate of potash, and fertilisers containing 7 per cent. or more of pure potash has been published in the French Official Gazette.

GERMANY.—A law dated July 14 and effective as from September 1, imposes a tax payable on the entry into consumption in Germany of saccharin of 2 Reichsmarks per kilo., and on dulcin of 0·6 Reichsmark per kilo. of pure sweetening material.

UNITED STATES OF AMERICA.—The United States Treasury Department has suspended until further notice the recent decision (No. T.D. 41561), which provided for the assessment of countervailing duties on certain metallurgical products.

VENEZUELA.—The text of the new Venezuelan Customs Law, published in the *Gaceta Oficial* for July 29, does not differ very much from the law of 1918, although it contains alterations affecting consular invoices, incorrectly assessed duties, and fines, etc.

SPAIN.—The translation of a notification, the effect of which is to alter the tariff classification of steels containing between 0·3 and 0·6 per cent. of carbon is given in the *Board of Trade Journal* for September 9.

New Italian Potash Fertiliser

KALIUZOTO, a new Italian chemical fertiliser, containing nitrogen, potash, and organic substances, is receiving considerable attention in Italy. The substance is prepared from residual molasses. Until now, it has been usual in the Italian molasses distilling industry to concentrate the residue of molasses and burn organic matter, leaving an ash rich in potash. Over 6,500 tons of this ash was exported from Italy in 1925. In the process, patented by Dr. E. Cerasoli, of Arpino, for the production of the fertiliser, diatomaceous earth, or kieselguhr, is allowed to absorb residual molasses until the consistency of the mass becomes almost solid. The fertiliser (Kaliuzoto) thus obtained is in the form of a granular, friable powder, not unlike superphosphate in appearance. It is stated that the porous silica which is obtained as a residue when leucite is decomposed by the action of hydrochloric acid by the Blanc process, also readily absorbs the residual molasses and thus offers an opportunity of utilising a by-product of that industry. Italy produces about 350,000 tons of beet sugar during a normal season, and if the entire production of molasses be distilled, an available supply of about 12,000 tons of residual molasses should be obtained. If porous silica derived from leucite be used as a carrier, it is claimed that the fertiliser obtained contains 1·1 per cent. nitrogen, 4·42 per cent. potash, 0·35 per cent. phosphoric anhydride and more than 20 per cent. of organic matter. The latter decomposes in the earth, having more or less the same action as stable manure. It is stated that Kaliuzoto has given satisfactory results in the practical experiments that have been made.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Mr. H. T. P. Gee, Patent and Trade Mark Agent, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to October 8, 1926.

"VETERSOL."

470,903.—For disinfectants. Class 2. Wright, Layman and Umney, Ltd., 66, Park Street, Southwark, London, S.E.1, manufacturing chemists and wholesale druggists. June 25, 1926.

"NEW PIN."

471,890.—For liquid glue, included in Class 1. Schofield and Sims, Ltd., 17, Market Street, Huddersfield, Yorkshire, manufacturers. July 29, 1926.

"TANCTECTOL."

472,064.—For paints, varnishes, enamels, dry colours, distempers, japans, lacquers, and anti-corrosive oils, all being goods included in Class 1. The International Paint and Compositions Co., Ltd., 31 and 32, Grosvenor Place, London, S.W.1, manufacturers and general merchants. August 6, 1926.

"TROPOSAN."

472,029.—For chemical substances prepared for use in medicine and pharmacy. Class 3. May and Baker, Ltd., Garden Wharf, Church Road, Battersea, London, S.W.1, manufacturing chemists. August 4, 1926.

Wood Distillation Industry in Canada

PRODUCTION of wood distillates and extracts in Canada in 1925 amounted in value to $1,989,996 according to the Dominion Bureau of Statistics at Ottawa. This figure was the lowest recorded since 1922 and compares with a corresponding output value of $2,283,422 in 1924 and $2,743,295 in 1923. Only ten establishments were in operation in 1925; two distillation plants were dismantled during the year. Representing a capital investment of $2,287,109, the ten plants gave employment to 309 persons throughout the year and used materials worth $847,663 in the manufacturing processes. In 1924 an average of 367 persons were given employment and materials used were worth over a million dollars.

Japanese Research in Chemistry and Physics

THE latest papers published by the Institute of Physical and Chemical Research of Tokyo, Japan, include the following: "Chemical Studies of Vitamin B in Japan," by U. Suzuki; "On the Catalytic Hydrogenation of the Carbonyl Group in Aromatic Compounds Under Pressure in the Presence of Copper. Parts I. and II.," by B. Kubota and T. Hayashi; "Pleochroic Haloes in Biotite. Probable Existence of the Independent Origin of the Actinium Series," by S. Timori and J. Yoshimura; "Effect of Electric Field on the Spectral Lines of Zinc and Cadmium," by Y. Fujioka; "On the Hardness of Different Structures in Steel," by K. Tamaru; and "Spectroscopic Study of the Discharge in Helium," by T. Takamine.

Chemical Works Fire

A SERIOUS outbreak of fire occurred at Netham Chemical Works, St. Georges, Bristol, belonging to the United Alkali Co., Ltd., on Monday evening. An employee who was working on some acid tanks noticed signs of fire in a tar dipping shed and gave the alarm. When the brigade arrived it was found that an isolated shed containing tar tanks was well alight, and that the fire had obtained such a hold, and was blazing so fiercely, that there was no possible hope of saving the building, so the firemen concentrated their efforts on preventing the fire from spreading to the other buildings. In this they proved successful, but by the time they had the fire under control the shed and its contents had been completely destroyed. The cause of the outbreak is unknown.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgment

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

PARKERS OIL CO., LTD., Windhill, Shipley, oil refiners. (C.C., 18/9/26.) £20 11s. 9d. August 13.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

HEDLEY (THOMAS) AND CO., LTD. (late THOMAS HEDLEY AND CO. (1905), LTD.), Newcastle-on-Tyne, soap makers. (M., 18/9/26.) Registered September 2, £75,000 debentures; general charge. *Nil. August 3, 1926.

LUCE'S EAU-DE-COLOGNE CO., LTD., Southampton. (M., 18/9/26.) Registered September 3, £2,000 (not ex.) charge, to Bank; charged on 179, High Street, Southampton. *Nil. September 8, 1925.

OCEAN CHEMICAL CO., LTD., Ramsbottom. (M., 18/9/26.) Registered September 3, £15,000 (not ex.) debenture, to Bank, general charge. *——. February 4, 1926.

Satisfaction

ASSOCIATED PRODUCTS, LTD., London, W., manufacturing chemists. (M.S., 18/9/26.) Satisfaction registered September 6, all moneys, etc., registered October 21, 1924.

London Gazette, &c.

Companies Winding Up Voluntarily

BRITISH WHITE RUSSIAN OIL REFINERIES, LTD. (C.W.U.V., 18/9/26.) A. Houghton, Cathedral House, 8, Paternoster Row, London. Incorporated Accountant appointed liquidator, August 24.

CENTRIFUGAL SEPARATORS, LTD. (C.W.U.V., 18/9/26.) A. Davidson appointed liquidator, August 30.

Partnership Dissolved

BARCLAY AND CO. James Arthur BATESON, hard and soft soap manufacturer, 130/132, Rice Lane, Walton, Liverpool, has retired from the firm as from September 1, 1926. Debts received and paid by George Winchester and William Muskett Delf, who are taking over the business of the firm as from September 1, 1926.

Centrifugal Separators, Ltd.

THIS company, the shareholders in which have passed a resolution for voluntary liquidation, was registered in October, 1919, to acquire the business carried on by the Hydraulic Separating and Trading Co., Ltd. The general effect of the proposed arrangement will be that the debts of the company and of its subsidiary, British Separators, Ltd., will be paid or released, in return for which the only remaining assets of Centrifugal Separators, Ltd., will be transferred to Cooke, Troughton and Simms, the manufacturers of the separators sold by British Separators, Ltd., and to whom the latter company owes considerable sums.

New Companies Registered

BRITISH BYE-PRODUCTS, LTD., Abbey House, Westminster, London.—Private company. Registered September 10. Nom. cap., £100 in £1 shares. To manufacture, market and commercialise bye-products from the gas and coal industries; to own, patent, and exploit chemical processes and formulæ incidental thereto, etc.

JEPSON (METALS), LTD., 42-46, Whitecross Street, London, E.C.1.—Private company. Registered September 11. Nom. cap., £6,000 in £1 shares. Merchants, dealers, or commission agents in steel, iron, tin, tinplates, ores (both ferrous and non-ferrous), and other metals, and to adopt an agreement with Jepson Brothers and Co., Ltd. Directors: A. O. Jepson, "Twycross," Lovelace Road, Surbiton, L. R. Jepson, and H. F. George.

KENILWORTH TANNERY, LTD., 15, Warwick Road, Kenilworth, Warwickshire.—Private company. Registered September 14. Nom. cap., £20,000 in £1 shares (5,000 7 per cent. cumulative preference). To acquire the freehold tannery factory, warehouses, and other property in Station Road, Warwick Road, Kenilworth, and to carry on the business of tanners and leather manufacturers formerly carried on by T. Day and Co., Ltd. Directors: C. Randall, junr., Abbotsfield, Kenilworth, tanner, and W. S. Fulford.

Research in the University of Illinois, U.S.A.

WE have received reprints of the following papers submitted for the degree of Doctor of Philosophy in chemistry in the Graduate School of the University of Illinois:—"Correlation of Physical and Chemical Properties in Alloys of the Ternary Type," by L. J. Wood; "Cinchophen Derivatives Containing Arsenic: Arsenic Derivatives of the Diphenyl Series," by Katharine Ogden; "The Use of Acid Anhydrides in the Preparation of Ketones by the Friedel and Crafts Reaction," and "The Synthesis of Dihydrochaulmoogric and Dihydrohydnocarpic Acids," by C. R. Noller; "A Study of the Possibility of a New Type of Isomerism in the Diphenylmethane Series," by C. L. Butler; "The Use of Oxygen in the Manufacture of Water Gas," by F. E. Vandaveer; "The Catalytic Reduction of Aromatic Amines," and "The Synthesis of Homologs of Dihydrochaulmoogric and Dihydrohydnocarpic Acids Containing a Cyclohexyl Group," by G. S. Hiers; "The Catalytic Reduction of Cinnamic Aldehyde to Cinnamyl Alcohol" and "Attempts to Synthesise Cantharidin," by W. F. Tuley; "Element No. 61 (Illinium)," by J. A. Harris; "The Nephropathic Action of Various Dicarbonylic Acids. The Fate of Certain Derivatives of Glutaric and Adipic Acids in the Animal Organism," by R. C. Corley; "The Concentration of Praseodymium Material and the Electrolytic Preparation and Properties of Metallic Praseodymium. Observations on the Rare Earths," by J. Wierda.

Research on Brewing

IN connection with the Institute of Brewing Research Scheme, a party of brewers and others paid a visit last week to certain hop gardens in Kent and inspected some of the latest appliances used for drying in the kilns. At a luncheon held at the Spa Hotel, Tunbridge Wells, Mr. Francis P. Whitbread, presiding, said that in the past the brewers were faced with a great difficulty, because there was no method of determining the preservative value of a particular variety of hop. But for some time the chemists had been at work on that problem, and he was sure they were within measurable distance of discovering an analysis which could be adopted for the purpose and which would be of great assistance to the trade in general.

Sea Birds and the Oil Menace

A NEW group, illustrating the oil menace to sea birds, has been placed in the Central Hall of the Natural History Museum at South Kensington. It consists of a portion of sea beach on the south coast showing the effect on marine bird life of oil refuse discharged by ships at sea. The birds exhibited include red-throated divers, guillemots and a razor bill. They were picked up from time to time on the beach in a dead or dying condition, their feathers clogged with oil. This oil floats on the surface of the water and congeals into the consistency of tar. When the birds dive the oil clogs their feathers. They can neither swim nor fly, and drift ashore and die of starvation.